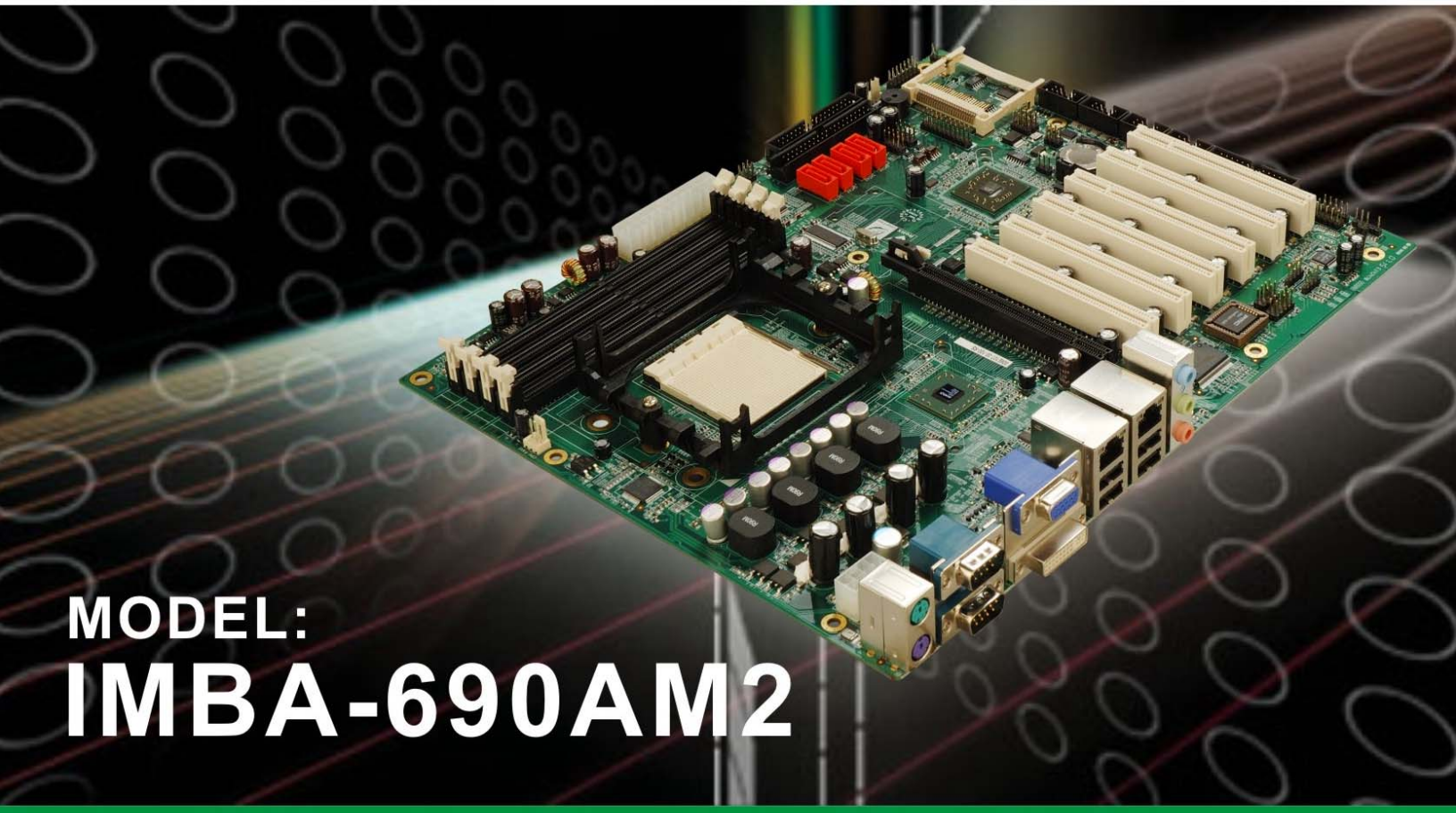
IEI Technology Corp.



MODEL:

IMBA-690AM2

ATX Motherboard with AMD® Athlon™ 64, Athlon™ 64 X2, Sempron™ CPU with VGA/DVI/TV-out, USB 2.0, SATA II, Dual PCIe GbE, PCI, PCIe x16, and Audio

User Manual

Rev. 1.00 AUGUST 2007

RoHS Lead Free

Revision

Date	Version	Changes
2007-08	1.00	Initial release

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Manual Conventions

WARNING!

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously. Warnings are easy to recognize. The word “warning” is written as “**WARNING**,” both capitalized and bold and is followed by text. The text is the warning message. A warning message is shown below:

WARNING:

This is an example of a warning message. Failure to adhere to warning messages may result in permanent damage to the IMBA-690AM2 or personal injury to the user. Please take warning messages seriously.

CAUTION!

Cautionary messages should also be heeded to help reduce the chance of losing data or damaging the IMBA-690AM2. Cautions are easy to recognize. The word “caution” is written as “**CAUTION**,” both capitalized and bold and is followed. The italicized text is the cautionary message. A caution message is shown below:

CAUTION:

This is an example of a caution message. Failure to adhere to cautions messages may result in permanent damage to the IMBA-690AM2. Please take caution messages seriously.

NOTE:

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes. Notes are easy to recognize. The word “note” is written as “**NOTE**,” both capitalized and bold and is followed by text. The text is the cautionary message. A note message is shown below:

NOTE:

This is an example of a note message. Notes should always be read. Notes contain critical information about the IMBA-690AM2. Please take note messages seriously.

Packing List

NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IMBA-690AM2 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the IMBA-690AM2 package.

- 1 x IMBA-690AM2 single board computer
- 1 x IDE cable
- 1 x I/O shielding
- 2 x SATA power cables
- 4 x SATA cables
- 2 x Dual RS-232 cables
- 1 x Backplate for AMD Socket AM2
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x QIG (quick installation guide)

Images of the above items are shown in **Chapter 3**.

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Glossary

AC '97	Audio Codec 97
ACPI	Advanced Configuration and Power Interface
APM	Advanced Power Management
ARMD	ATAPI Removable Media Device
ASKIR	Shift Keyed Infrared
ATA	Advanced Technology Attachments
BIOS	Basic Input/Output System
CFII	Compact Flash Type 2
CMOS	Complementary Metal Oxide Semiconductor
CPU	Central Processing Unit
Codec	Compressor/Decompressor
COM	Serial Port
DAC	Digital to Analog Converter
DDR	Double Data Rate
DIMM	Dual Inline Memory Module
DIO	Digital Input/Output
DMA	Direct Memory Access
EIDE	Enhanced IDE
EIST	Enhanced Intel SpeedStep Technology
FDD	Floppy Disk Drive
FDC	Floppy Disk Connector
FFIO	Flexible File Input/Output
FIFO	First In/First Out
FSB	Front Side Bus
IrDA	Infrared Data Association
HDD	Hard Disk Drive
IDE	Integrated Data Electronics
I/O	Input/Output
L1 Cache	Level 1 Cache
L2 Cache	Level 2 Cache
LCD	Liquid Crystal Display
LPT	Parallel Port Connector
LVDS	Low Voltage Differential Signaling
MAC	Media Access Controller
OS	Operating System
PCI	Peripheral Connect Interface
PIO	Programmed Input Output
PnP	Plug and Play
POST	Power On Self Test
RAM	Random Access Memory
SATA	Serial ATA
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology
SPD	Serial Presence Detect
S/PDI	Sony/Philips Digital Interface
SDRAM	Synchronous Dynamic Random Access Memory
SIR	Serial Infrared
UART	Universal Asynchronous Receiver-transmitter
USB	Universal Serial Bus
VGA	Video Graphics Adapter

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Chapter

1

Introduction

1.1 Overview

The IMBA-690AM2 ATX form factor motherboard is an AMD Socket AM2 processor platform. Up to 8GB of DDR2 DIMM SDRAM and up to four SATA II hard disk drives (HDD) are supported. SATA drives can be installed in a RAID configuration. High-performance PCI Express (PCIe) Gigabit Ethernet (GbE) connectivity is integrated into the system. Six PCI expansion slots along with eight USB 2.0 channels enable system flexibility and expansion. Multi-display interfaces and dual display functions ensure display versatility. Support for a (optional) trusted platform module (TPM) provides additional system security during system boot-up.

1.1.1 IMBA-690AM2 Features

Some of the IMBA-690AM2 features are listed below.

- Supports the following AMD Socket AM2 processors:
  - AMD Athlon™ 64 X2 dual-core
  - AMD Athlon™ 64
  - AMD Sempron™
- Supports four 240-pin 400MHz, 533MHz, 667MHz or 800MHz DDR2 DIMMs with a maximum capacity of 8GB.
- Four SATA II drives with transfer rates of 3.0Gb/s supported
- Two Ultra ATA 133, Ultra ATA 100, Ultra ATA 66 or Ultra ATA 33 IDE HDDs supported
- Eight USB 2.0 devices supported
- Six PCI and one PCIe x16 interfaces supported
- Dual PCIe GbE Ethernet connectors
- Multi-display interfaces (DVI, VGA and TV-out) and dual display functions supported
- ATX form factor
- RoHS compliant
- Supports ATX power supplies

1.2 IMBA-690AM2 Overview

1.2.1 IMBA-690AM2 Overview Photo

The IMBA-690AM2 has a wide variety of peripheral interface connectors. **Figure 1-1** is a labeled photo of the peripheral interface connectors on the IMBA-690AM2.

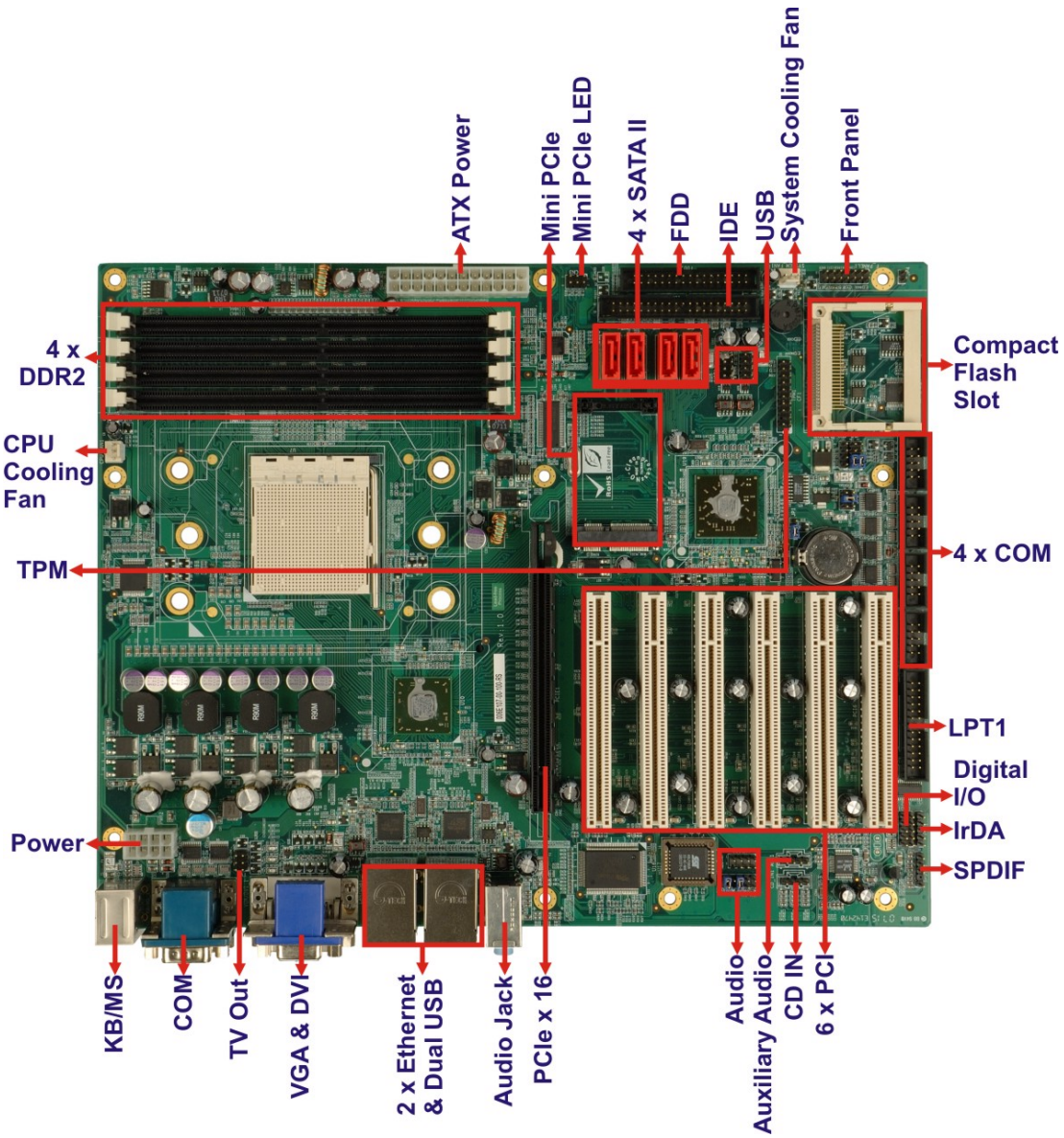

Figure 1-1: IMBA-690AM2 Overview

1.2.2 IMBA-690AM2 Peripheral Connectors and Jumpers

The IMBA-690AM2 has the following connectors on-board:

- 2 x Audio connectors
- 1 x AUX IN connector
- 1 x ATX power connector
- 1 x CD IN connector
- 1 x CompactFlash® card slot
- 1 x Digital input/output connector
- 4 x DDR2 DIMM slots
- 2 x Fan connectors
- 1 x FDD connector
- 1 x Front panel connector
- 1 x IDE disk drive connector
- 1 x Infrared interface connector
- 1 x Mini PCIe socket
- 1 x Mini PCIe LED connector
- 1 x Parallel port connector
- 6 x PCI slots
- 1 x PCIe x16 slot
- 1 x Power connector
- 1 x RS-422/485 connector (for COM3)
- 4 x Serial port connectors
- 4 x Serial ATA II (SATA II) drive connectors
- 1 x SPDIF connector
- 1 x TPM connector
- 1 x TV Out connector
- 2 x USB 2.0 connectors (support four USB 2.0 devices)

The IMBA-690AM2 has the following external peripheral interface connectors on the board rear panel.

- 3 x Audio Jacks

- 2 x Ethernet connectors
- 1 x DVI-D connector
- 2 x PS/2 connectors
- 2 x Serial port connectors
- 4 x USB connectors
- 1 x VGA connector

The IMBA-690AM2 has the following on-board jumpers:

- CF card setup
- Clear CMOS
- RS-232/422/485 COM3 setup
- COM3 voltage setup

1.2.3 Technical Specifications

IMBA-690AM2 technical specifications are listed in **Table 1-1**. See **Chapter 2** for details.

Specification	IMBA-690AM2
Form Factor	ATX
System CPU	AMD Socket AM2 Athlon™ 64 X2 AMD Socket AM2 Athlon™ 64 AMD Socket AM2 Sempron™
HyperTransport™ Technology	A 1000 MHz HyperTransport™ interfaces is supported
System Chipset	Northbridge: AMD 690G Southbridge: AMD SB600
Memory	Four 240-pin DDR2 DIMM sockets support four 400MHz, 533MHz, 667MHz, or 800MHz un-buffered DDR2 DIMMs with a maximum capacity of 2GB each

Super I/O	Fintek F71882FG
Display Interface	VGA integrated in the AMD® 690G with ATI Radeon™ Xpress 1250 Graphic Core
	Supports HDTV resolutions up to 1080i by component interface
	DVI by AMD® 690G with dual display support
BIOS	AMI Flash BIOS
Audio	RealTek ALC655 with AC'97 codec 5.1 channel
LAN	Dual Broadcom BCM5787M PCIe GbE controllers
COM	Five RS-232 serial ports One RS-232/422/485 serial port
USB2.0	Eight USB 2.0 devices supported
IDE	One 40-pin IDE connector connects to two Ultra ATA33/66/100/133 devices
SATA	Four 3.0Gb/s SATA II drives supported
FDD	One floppy disk drive supported
Keyboard/mouse	Two PS/2 connectors
Expansion	Six PCI slots One PCIe x16 slot
Digital I/O	One 8-bit digital input/output connector; 4-bit input/4-bit output
Watchdog Timer	Software programmable 1-255 sec. by super I/O
Infrared	One IrDA connector by Super I/O
Power Supply	ATX power

Power Consumption	3.3V@1.01A, 5V@3.22A, 12V@7.15A and 5VSB@0.14A (AMD® Athlon 64 X2 dual-core 6000+ CPU and four 512MB 533MHz DDR2 DIMM)
Temperature	0ºC – 60ºC (32ºF - 140ºF)
Humidity (operating)	5%~95% non-condensing
Dimensions (LxW)	305mm x 244mm
Weight (GW)	1500g

Table 1-1: Technical Specifications

NOTE:

Due to the limitation of Windows 32-bit operating system, when more than 4GB of physical memory is installed, the actual memory available for the operating system is less than 4GB. The Windows 64-bit operating system doesn't have such limitation.

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Chapter

2

Detailed Specifications

2.1 Dimensions

2.1.1 Board Dimensions

The dimensions of the board are listed below:

- **Length**: 305mm
- **Width**: 244mm

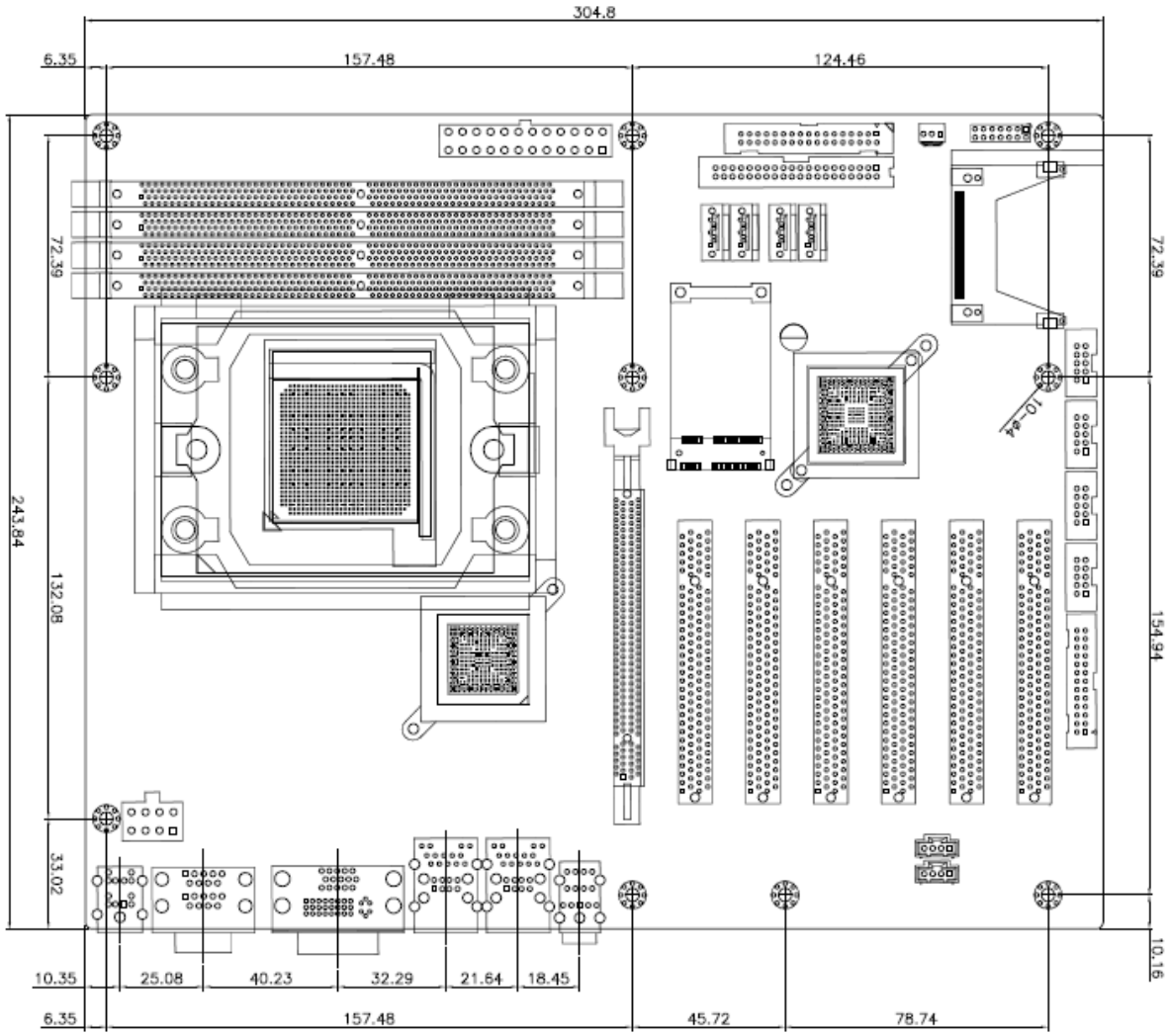

Figure 2-1: IMBA-690AM2 Dimensions (mm)

2.1.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 2-2**.

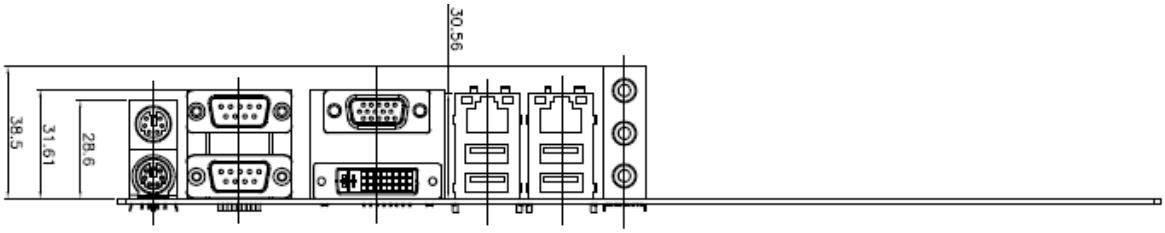

Figure 2-2: External Interface Panel Dimensions (mm)

2.2 Data Flow

Figure 2-3 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

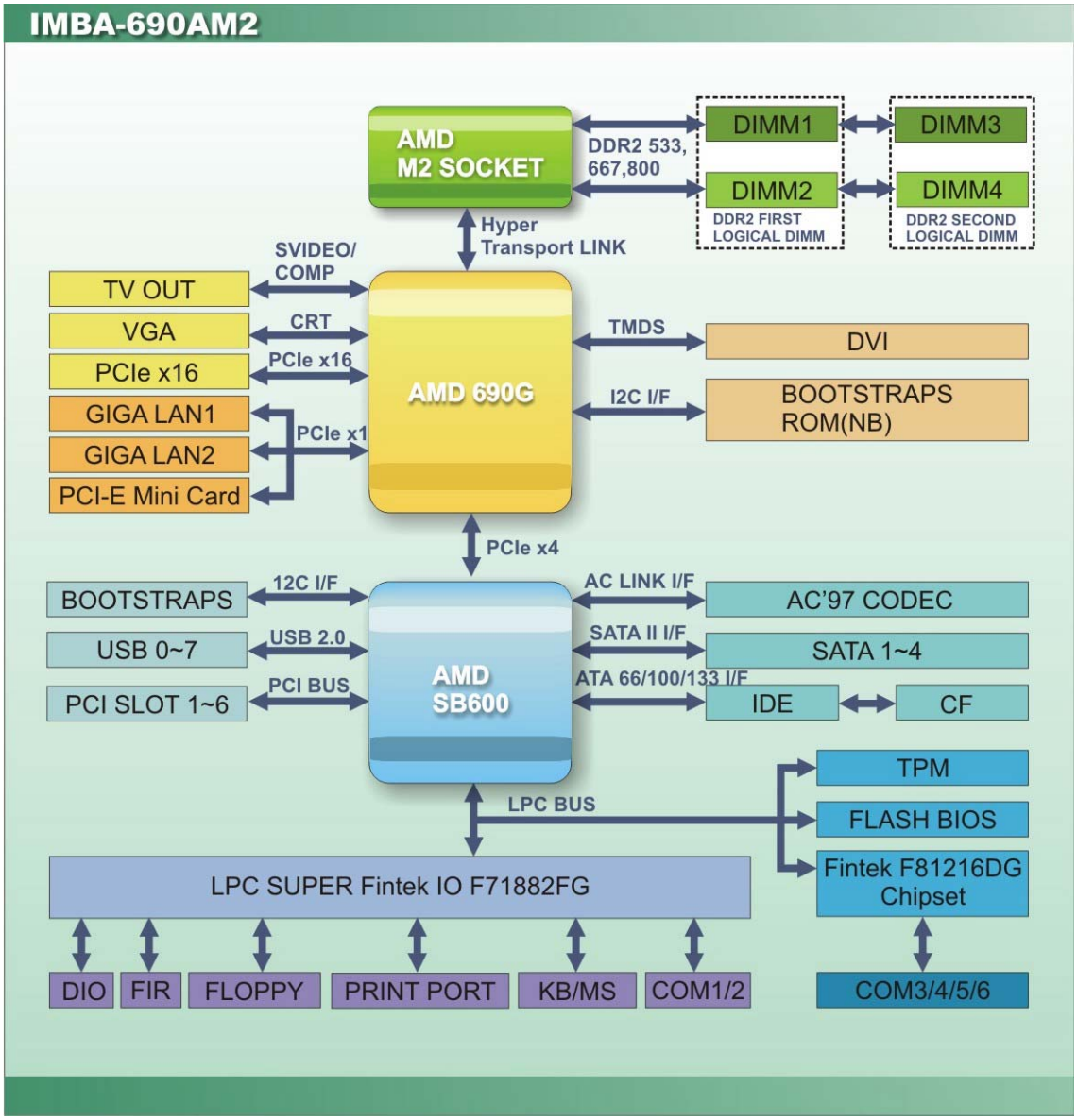

Figure 2-3: Data Flow Block Diagram

2.3 Compatible Processors

2.3.1 Supported Processors

The IMBA-690AM2 supports the following AMD Socket AM2 processors

- AMD Athlon™ 64 processor
- AMD Athlon™ 64 X2 dual-core processor
- AMD Sempron™ processor

2.3.2 DDR2 Memory Controller

All processors supported by the IMBA-690AM2 CPU card have their own DDR2 memory controller. The DDR2 controller has the following features:

- Up to 12.8GB/s memory bandwidth
- 800MHz 128-bit DDR2 SDRAM controller
- Supports up to four un-buffered DDR2 DIMM
- Each DIMM has a maximum capacity of 2GB

The DDR2 controller on the processor is interfaced to four DIMM sockets on the IMBA-690AM2.

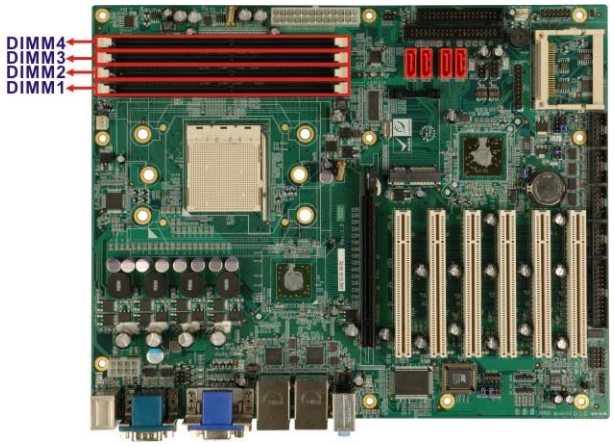

Figure 2-4: DIMM Sockets

2.3.3 Processor Electrical Interfaces

The supported processors have the following electrical interfaces:

- HyperTransport™ technology: LVDS-like differential, unidirectional
- DDR SDRAM: SSTL_2 per JEDEC specification
- Clock, reset, and test signals also use DDR SDRAM-like electrical specifications.

2.3.4 Processor Power Management

The supported processors have the following power management features:

- Multiple low-power states including C1E
- System Management Mode (SMM)
- ACPI compliant, including support for processor performance states

2.4 AMD 690G Northbridge Chipset

2.4.1 PCI Express Interface

The AMD 690G PCIe bus is compliant with the PCI Express 1.1a. The AMD 690G has one PCIe x16 interfaces and four PCIe x1 interfaces. The PCIe x16 interface supports a PCIe x16 graphics card. Two of the PCIe x1 lanes are connected to two PCIe GbE controllers and a third PCIe x1 lane is connected to a Mini-PCIe expansion slot.

2.4.1.1 PCIe x16 Expansion

One of two PCIe interfaces from the AMD 690G is interfaced to a PCIe x16 expansion slot. See **Figure 2-5**. A standard PCIe x16 expansion board can be inserted into the slot to provide additional functionality to the system.

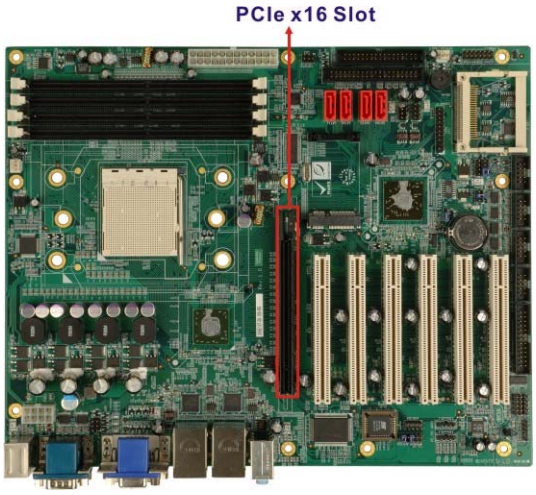

Figure 2-5: PCIe x1 Expansion Slot

2.4.1.2 PCIe GbE Ethernet

Two PCIe x1 lanes from the AMD 690G Northbridge are interfaced to two Broadcom BCM5787M PCIe GbE controllers shown in **Figure 2-6** below.

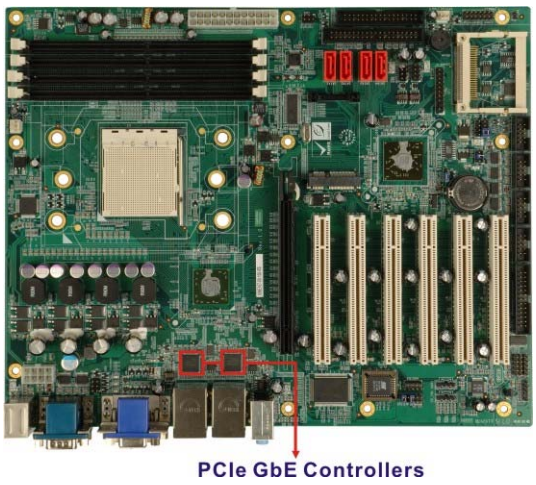

Figure 2-6: Broadcom PCI GbE Controllers

The Broadcom BCM5787M is a 10/100/1000BASE-T Ethernet LAN controller. The BCM5787M combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, a PCIe bus interface, and an on-chip buffer memory. Some of the BCM5787 controller features are listed below:

- Integrated 10/100/1000BASE-T transceiver
- Automatic MDI crossover function
- PCIe v1.0a
- 10/100/1000BASE-T full/half-duplex MAC
- Wake on LAN support meeting the ACPI requirements
- Statistics for SNMP MIB II, Ethernet-like MIB, and Ethernet MIB (802.3z, clause 30)
- Serial EEPROM or serial flash support

2.4.1.3 PCIe Mini Card

One PCIe x1 lanes from the AMD 690G Northbridge are interfaced to a PCIe Mini Card connector shown in **Figure 2-6** below.

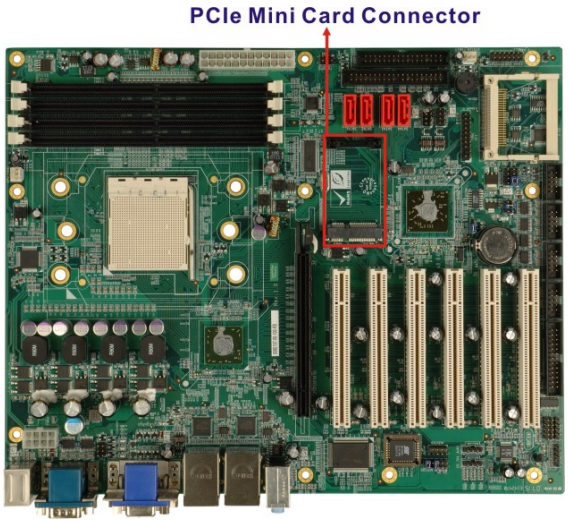

Figure 2-7: PCIe Mini Card Connector

2.4.2 Acceleration Features

The AMD 690G has the following 2D acceleration features:

- Highly optimized 128-bit engine, capable or processing multiple pixels per clock
- Supports a maximum resolution of 2048x1536 @ 32bpp
- Game acceleration including support for Microsoft's DirectDraw

The AMD 690G also has the following 3D acceleration features:

- Full DirectX 9.0 support
- 3D Texture support, including projective 3D textures
- Anti-aliasing using multi-sampling algorithm with support for 2, 4, and 6 samples
- New generation rendering engine provides top 3D performance
- Support for OpenGL format for Indirect Vertices in Vertex Walker

Motion video acceleration features on the AMD 690G include:

- Enhanced MPEG-2 hardware decode acceleration
- MPEG-4 decode support
- Hardware acceleration for WMV9 playback
- Supports top quality DVD and time-shifted SDTV/HDTV television playback with low CPU usage

2.4.3 Display Support

The AMD 690G supports dual independent displays. The following display interface connectors are on the IMBA-690AM2:

- TV Out
- DVI-D
- VGA

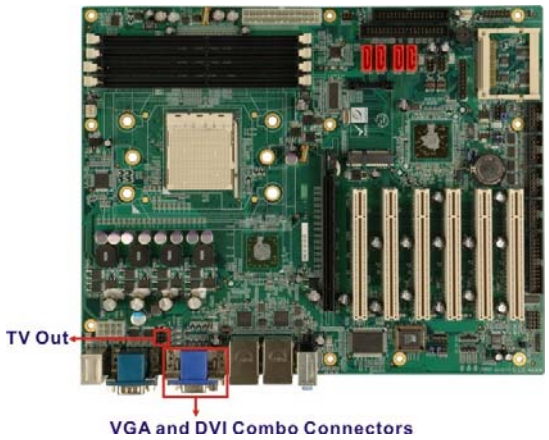

Figure 2-8: Display Interfaces

2.4.3.1 TV Out

TV Out features include:

- Integrated TV encoder from Xilleon products with integrated Avivo™
- Supports Macrovision 7.1 copy protection standard (required by DVD players)
- Supports the formats of component, composite and S-video outputs

2.4.3.2 Multiple Display Features

The Multiple display features include

- Dual independent displays including one digital output
- Resolution, refresh rates, and display data can be completely independent for the two display paths
- Supports both interlaced and non-interlaced displays

2.4.3.3 DVI

DVI support features include:

- Supports a TMDS interface, enabling DVI <1650 Mbps/channel with 165 MHz pixel clock rate per link
- HDCP 1.1 support on data stream with on-chip key storage

2.5 AMD SB600 Southbridge Chipset

2.5.1 CPU Interface

The AMD SB600 Southbridge chipset supports the following AMD Socket AM2 processors:

- AMD Athlon™ 64 X2 dual-core processor
- AMD Athlon™ 64 processor
- AMD Sempron™ processor

2.5.2 A-Link Xpress II interface to the Northbridge

The AMD SB600 Southbridge is connected to the AMD 690G Northbridge chipset through an A-Link Xpress II interface. Some of the A-Link Xpress II interface features are listed below:

- 1/2/4-lane A-Link Xpress II interface
- Dynamic detection of lane configuration
- High data transfer bandwidth

2.5.3 PCI Host Bus Controller

The PCI interface on the AMD SB600 Southbridge is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

- PCI rev. 2.3 specifications
- PCI bus at 33 MHz
- Up to 6 master devices
- 40-bit addressing
- Interrupt steering for plug-n-play devices
- Concurrent PCI operations
- Hiding of PCI devices by BIOS/hardware
- Spread spectrum

The PCI bus is interfaced to six PCI expansion slots (see **Figure 2-9**).

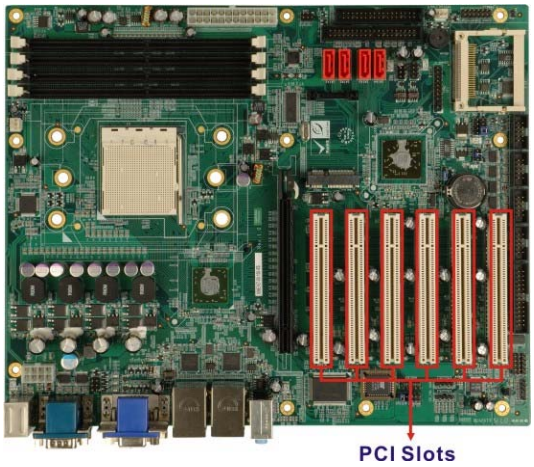

Figure 2-9: PCI Expansion Slots

2.5.4 USB Controllers

Eight of the ten high-speed, full-speed or low-speed USB ports on the AMD SB600 are implemented on the IMBA-690AM2. High-speed USB 2.0, with data transfers of up to 480MB/s, is enabled with the AMD SB600 integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling are enabled with the integrated Universal Host Controller Interface (UHCI) controllers.

The USB controller supports the following:

- USB 1.1 (“Low Speed”, “Full Speed”) and 2.0 (“High Speed”)
- ACPI S1~S5
- Legacy keyboard/mouse
- USB debug port
- Port disable with individual control

Four of the eight USB ports are interfaced to two 8-pin headers on the IMBA-690AM2. Four more USB ports are interfaced to four external USB connectors. See **Figure 2-10**.

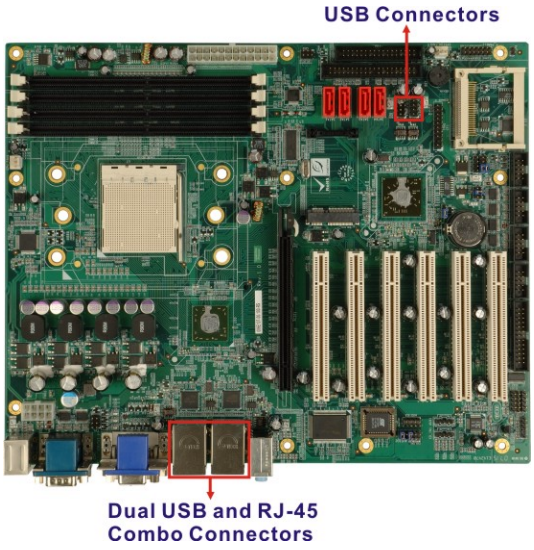

Figure 2-10: USB Connectors

2.5.5 SMBus Controller

The AMD SB600 Southbridge chipset SMBus Controller is SMBus Rev. 2.0 compliant and supports SMBALERT # signal / GPIO.

2.5.6 Interrupt Controller

The AMD SB600 Southbridge interrupt controller supports the following:

- IOAPIC/X-IO APIC mode for 24 channels of interrupts
- 8259 legacy mode for 15 interrupts
- Programmable level/edge triggering on each channels
- Serial interrupt on quiet and continuous modes

2.5.7 DMA Controller

The AMD SB600 Southbridge has two cascaded 8237 DMA controllers that support the following:

- PC/PCI/DMA
- LPC DMA

- Type F DMA

2.5.8 LPC host bus controller

The AMD SB600 Southbridge LPC interface complies with the LPC 1.1 and LPC 1.2 specifications. The LPC bus from the Southbridge is connected to the following components:

- BIOS chipset
- Super I/O chipset
- TPM connector

Some of the features of the LPC bus are listed below.

- Supports LPC based super I/O and flash devices
- Supports two master/DMA devices
- Supports TPM version 1.1/1.2 devices for enhanced security
- Supports SPI devices

2.5.9 SATA II AHCI Controller

The integrated SATA controllers on the AMD SB600 Southbridge support four SATA II drives on the IMBA-690AM2 with independent DMA operations. The SATA controller supports the following:

- Four SATA ports, complying with SATA 2.0 specifications
- SATA II 3.0GHz PHY, with backward compatibility with 1.5GHz
- RAID stripping (RAID 0) across all 4 ports
- RAID mirroring (RAID 1) across all 4 ports
- RAID 10 (4 ports needed)
- Both AHCI mode and IDE mode
- Advanced power management with AHCI mode

The four SATA connectors are shown in **Figure 2-11**.

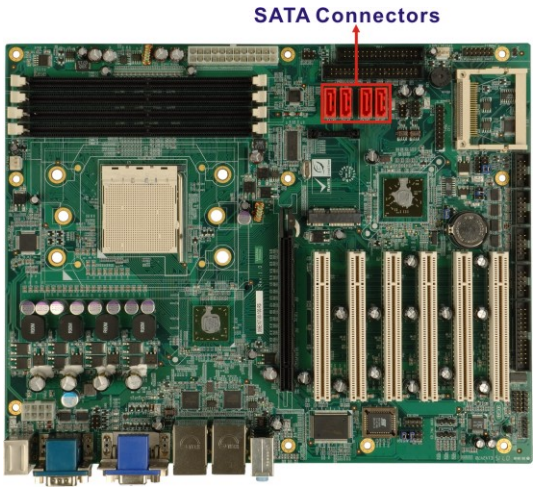

Figure 2-11: SATA Connectors

2.5.10 IDE Controller

The AMD SB600 Southbridge IDE controller is interfaced to a single IDE connector. The IDE controller has the following specifications.

- Single PATA channel support
- Support PIO, multi-word DMA, and Ultra DMA 33/66/100/133 modes
- 32x32 byte buffers on each channel for buffering
- Swap bay support by tri-state IDE signals
- Supports Messages Signaled Interrupt (MSI)
- Integrated IDE series resistor

The IDE connector is shown in **Figure 2-12**.

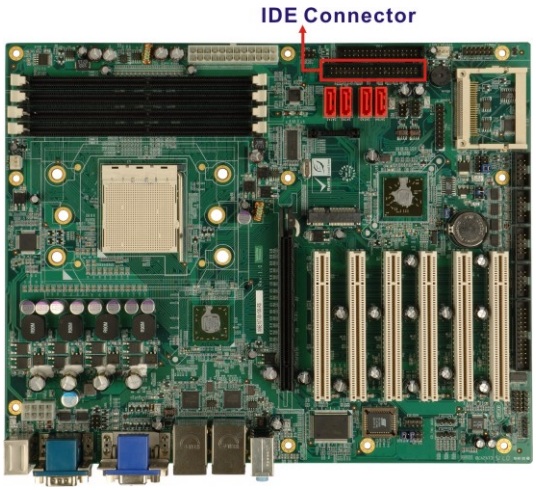

Figure 2-12: IDE Connector

2.5.11 AC Link interface

The AMD SB600 Southbridge AC Link interface has the following features:

- Supports for both audio and modem codecs
- Compliant with AC-97 codec Rev. 2.3
- 6/8 channel support on audio codec
- Multiple functions for audio and modem codec operations
- Bus master logic
- Supports up to 3 codecs simultaneously
- Supports SPDIF output
- AC Link

The AC Link Interface is connected to a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel RealTek ALC655 audio codec. The ALC655 is then connected to three externally accessible audio jacks. See **Figure 2-13**.

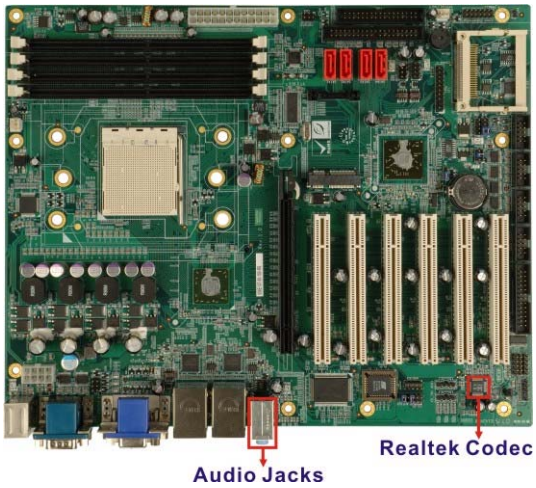

Figure 2-13: Audio Codec and Audio Jacks

Some of the features of the ALC655 are listed below:

- Complies with PC99/2001 systems audio performance requirements
- Complies with Microsoft WHQL/WLP 2.0 audio requirements
- 16-bit Stereo full-duplex CODEC with 48KHz sampling rate
- Compliant with AC'97 Rev 2.3 specifications
  - Front-Out, Surround-Out, MIC-In and LINE-In Jack Sensing
  - 14.318MHz -> 24.576MHz PLL to eliminate crystal
  - 12.288MHz BITCLK input
  - Integrated PCBEEP generator to save buzzer
  - Interrupt capability
- Three analog line-level stereo inputs with 5-bit volume control, LINE_IN, CD, AUX
- High-quality differential CD input
- Two analog line-level mono inputs: PCBEEP, PHONE-IN
- Dedicated Front-MIC input for front panel applications (software selectable)
- Boost preamplifier for MIC input
- LINE input shared with surround output; MIC input shared with Center and LFE output
- Built-in 50mW/20ohm amplifier for both Front-out and Surround-Out
- External Amplifier Power Down (EAPD) capability
- Power management and enhanced power saving features
- Supports Power-Off CD function

- Adjustable VREFOUT control
- Supports 48KHz S/PDIF output, complying with AC'97 Rev 2.3 specifications
- Supports 32K/44.1K/48KHz S/PDIF input
- Power support: Digital: 3.3V; Analog: 3.3V/5V
- EAX™ 1.0 & 2.0 compatible
- Direct Sound 3D™ compatible
- A3D™ compatible
- I3DL2 compatible
- HRTF 3D positional audio
- 10-band software equalizer
- Voice cancellation and key shifting in Karaoke mode
- AVRack® Media Player
- Configuration Panel for improved user convenience

2.5.12 Timers

The AMD SB600 south bridge has the following timers

- 8254-compatible timer
- Microsoft High Precision Event Timer (HPET)
- ACPI power management timer

2.5.13 RTC (Real Time Clock)

256 bytes of battery backed RAM is provided by the real time clock (RTC) integrated into the AMD SB600. The RTC keeps track of the time and stores system data even when the system is turned off. Some of the features of the RTC are listed below:

- 256-byte battery backed CMOS RAM
- Hardware supported century rollover
- RTC battery monitoring feature

2.5.14 Power Management

ACPI specification 3.0 compliant power management schemes on the AMD SB600 include:

- Supports C2, C3, C4
- Supports C1e and C3 pop-up (AMD platform only)
- Supports S0, S1, S2, S3, S4, and S5
- Supports SpeedStep™
- Full support for On-Now™
- Supports CPU SMM, generating SMI# signal upon power management events
- GPIO supports on external wake up events
- Supports CLKRUN# on PCI power management
- Provides clock generator and CPU STPCLK# control
- Hardware monitoring support
- Support for ASF

2.5.15 Hardware Monitor

The AMD SB600 has the following hardware monitoring features:

- Supports 3 Independent Fan Control outputs
- Supports 4 thermal diode temperature sensing functions
- Supports 1 AMDSI function

2.6 LPC Bus Components

2.6.1 LPC Bus Overview

The LPC bus is connected to components listed below:

- BIOS chipset
- Super I/O chipset
- Serial port chipset
- TPM module connector

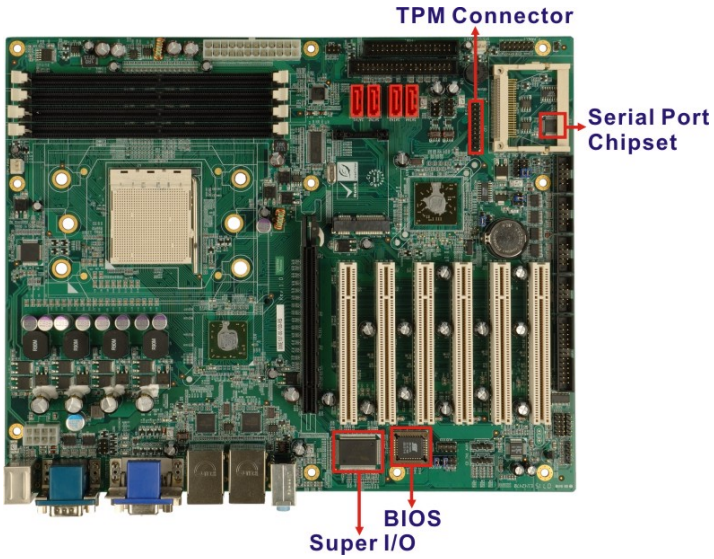

Figure 2-14: LPC BUS Components

2.6.2 BIOS Chipset

The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset. Some of the BIOS features are listed below:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (Pre-boot Execution Environment) support
- USB booting support

2.6.3 TPM Module

A TPM connector on the IMBA-690AM2 is interfaced to the AMD SB600 Southbridge through the LPC bus. The AMD SB600 Southbridge supports TPM version 1.1 and TPM version 1.2 devices for enhanced security. Three TPM are available from IEI. The three IEI TPM are listed below:

- Infineon TPM module
- Sinosun TPM module
- Winbond TPM module

For more information about these modules please refer to **Chapter 3** or contact the IMBA-690AM2 reseller or vendor. Alternatively, please contact IEI at sales@iei.com.tw.

2.6.4 Super I/O chipset

The Fintek F71882FG Super I/O chipset is connected to the AMD SB600 Southbridge through the LPC bus. The Fintek F71882FG is an LPC interface-based Super I/O device that comes with Environment Controller integration. Some of the features of the Fintek F71882FG chipset are listed below:

- Comply with LPC Spec. 1.0
- Support DPM (Device Power Management), ACPI
- 6/12 VID pins for VRM9.0/10.0/11.0* and CPU VID OTF (On The Fly)
- Easy voltage sensor I/O (VSI/VSO) for Vcore change use.
- Support automatic and dynamic voltage change function (2 Turbo pins Turbo1# and Turbo2# for VID usage)
- Provides one FDC, two UARTs, KBC and Parallel Port
- H/W monitor functions
- SPI interface for BIOS usage
- Support AMD SID/SIC interface and Intel SST/PECI interface
- 32 GPIO Pins for flexible application
- 24/48 MHz clock input
- Packaged in 128-PQFP and powered by 3.3VCC

Some of the Super I/O features are described in more detail below:

2.6.4.1 Super I/O LPC Interface

The LPC interface on the Super I/O complies with the AMD® Low Pin Count Specification Rev. 1.0. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

2.6.4.2 Super I/O Floppy Disk Drive (FDD) Controller

The Super I/O FDD controller is compatible with the following specifications.

- Compatible with IBM PC AT disk drive systems

- Variable write pre-compensation with track selectable capability
- Support vertical recording format
- DMA enable logic
- 16-byte data FIFOs
- Support floppy disk drives and tape drives
- Detects all overrun and under run conditions
- Built-in address mark detection circuit to simplify the read electronics
- Completely compatible with industry standard 82077
- 360K/720K/1.2M/1.44M/2.88M format; 250K, 300K, 500K, 1M, 2M bps data transfer rate

2.6.4.3 Super I/O 16C550 UARTs

The onboard Super I/O has two integrated 16C550 UARTs that can support the following:

- Fully programmable serial-interface characteristics
- Baud rate up to 115.2K
- Support IRQ sharing

2.6.4.4 Super I/O Enhanced Hardware Monitor

The Super I/O Enhanced Hardware Monitor monitors three thermal inputs, VBAT internally, and nine voltage monitor inputs. These hardware parameters are reported in the BIOS and can be read from the BIOS Hardware Health Configuration menu.

2.6.4.5 Super I/O Fan Speed Controller

The Super I/O fan speed controller enables the system to monitor the speed of the fan. One of the pins on the fan connector is reserved for fan speed detection and interfaced to the fan speed controller on the Super I/O. The fan speed is then reported in the BIOS.

2.6.4.6 Super I/O Keyboard and Mouse Controller

The Super I/O keyboard and mouse controller can execute the 8042 instruction set. Some of the keyboard and mouse controller features are listed below:

- 8042 based with optional F/W from AMIKKEYTM-2, with 2K bytes of

programmable ROM, and 256 bytes of RAM

- Asynchronous Access to Two Data Registers and One status Register
- Software compatibility with the 8042
- Support PS/2 mouse
- Support both interrupt and polling modes
- Fast Gate A20 and Hardware Keyboard Reset
- 6 MHz, 8 MHz, 12 MHz, or 16 MHz operating frequency

2.6.4.7 Super I/O Infrared

The Super I/O has dedicated infrared (IrDA) pins that are interfaced to an IrDA connector. The IrDA connector supports IrDA version 1.0 SIR protocol with maximum baud rate up to 115.2K bps.

2.6.5 Serial Port Chipset

An onboard Fintek F81216DG chipset provides access to four additional UART serial ports (COM3, COM4, COM5 and COM6). UART includes 16-byte send/receive FIFO. The Fintek serial port chipset is interfaced to the Southbridge chipset through the LPC bus. Some of the features of the Fintek chipset are listed below:

- Supports LPC interface
- Provides UART (16550 asynchronous) ports
  - 1 x Pure UART
  - 1 x UART+IR
- One Watch dog timer with WDTOUT# signal
- One Frequency input 24/48MHz
- Powered by 3Vcc

2.7 Environmental and Power Specifications

2.7.1 System Monitoring

Three thermal inputs on the IMBA-690AM2 Super I/O Enhanced Hardware Monitor monitor the following temperatures:

- CPU temperature

- System temperature

Five voltage inputs on the IMBA-690AM2 Super I/O Enhanced Hardware Monitor monitors the following voltages:

- VCore
- +1.8V
- +1.2V
- +5.0V
- +12V
- +1.5V
- VCC
- VSB
- VBAT

The IMBA-690AM2 Super I/O Enhanced Hardware Monitor also monitors the following fan speeds:

- CPU Fan speed
- System Fan speed

The values for the above environmental parameters are all recorded in the BIOS Hardware Health Configuration menu.

2.7.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the IMBA-690AM2 are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the Northbridge and Southbridge chipsets to ensure the operating temperature of these chips remain low.

2.7.3 Power Consumption

Table 2-1 shows the power consumption parameters for the IMBA-690AM2 running with an AMD® Athlon™ 64 X2 dual-core 6000+ CPU and four 512MB 533MHz DDR2 DIMM.

Voltage	Current
+3.3V	1.01A
+5.0V	3.22A
+12V	7.15A
5VSB	0.14A

Table 2-1: Power Consumption

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Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IMBA-690AM2 may result in permanent damage to the IMBA-690AM2 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-690AM2. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-690AM2, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the IMBA-690AM2, place it on an antic-static pad. This reduces the possibility of ESD damaging the IMBA-690AM2.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the IMBA-690AM2 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 3.1**.
- Make sure the packing box is facing upwards so the IMBA-690AM2 does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.

3.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IMBA-690AM2 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

3.3.1 Package Contents

The IMBA-690AM2 is shipped with the following components:

Quantity	Item and Part Number	Image
1	IMBA-690AM2 sigle board computer	
1	ATA 66/100 flat cable (P/N: 32200-000052-RS)	
1	I/O Shielding (P/N: 45014-0008C0-00-RS)	
2	Dual RS-232 cables (P/N: 32200-004101-RS)	

4	SATA cables (P/N: 32000-062800-RS)	
2	SATA power cables (P/N: 32100-088600-RS)	
1	Mini jumper pack	
1	Quick Installation Guide	
1	Utility CD	

Table 3-1: Package List Contents

3.4 Optional Items

CPU cooler (P/N: CF-AM2-RS)	
CPU cooler (P/N: CF-519-RS)	
CPU cooler (P/N: CF-478A-RS)	
FDD cable (P/N: 32200-000001-RS)	
LPT cable (P/N: 19800-000049-RS)	
4-port USB cable (P/N: CB-USB14-RS)	

HDTV Cable Set comprises a S-Video cable and a TV-out cable (shown as images below) (**P/N**: HDTVCABLESET-01)	
TV-out extension cable with Composite / S-Video / Component output (Max.1080i HDTV resolution supported)	
TV-out cable with 7-pin mini din on bracket	

Table 3-2: Package List Contents

Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

Section 4.1.1 shows peripheral interface connector locations. **Section 4.2** lists all the peripheral interface connectors seen in **Section 4.1.1**.

4.1.1 IMBA-690AM2 Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

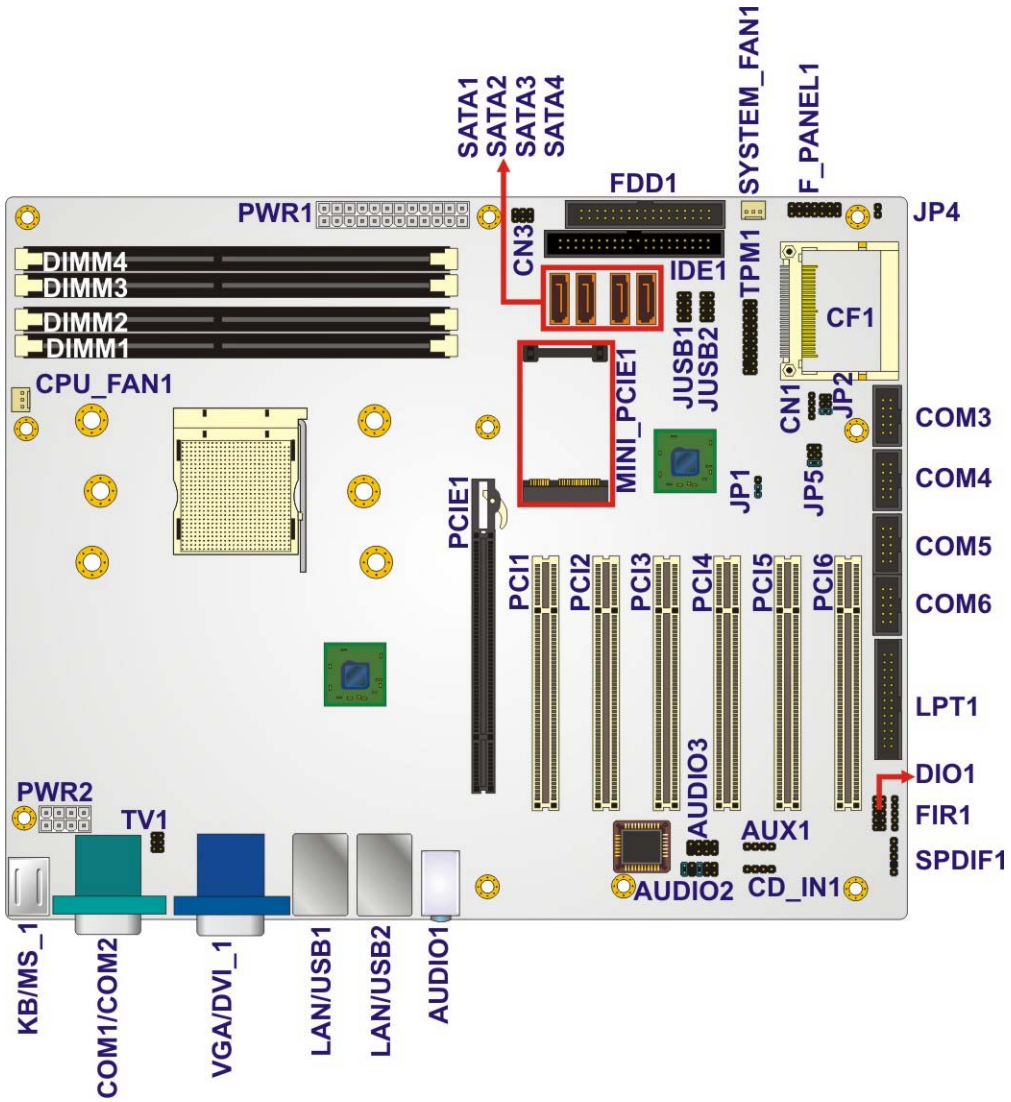


Figure 4-1: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the IMBA-690AM2. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
Audio connector (8-pin)	8-pin header	AUDIO3
Audio connector (10-pin)	10-pin header	AUDIO2
Audio CD In connector	4-pin header	CD_IN1
Auxiliary audio connector	4-pin header	AUX1
ATX power connector	24-pin ATX	PWR1
CompactFlash® card slot	50-pin slot	CF1
Cooling fan connector (CPU)	3-pin wafer connector	CPU_FAN1
Cooling fan connector (System)	3-pin wafer connector	SYSTEM_FAN1
Digital input/output connector	10-pin header	DIO1
DIMM sockets	240-pin DIMM socket	DIMM1
DIMM sockets	240-pin DIMM socket	DIMM2
DIMM sockets	240-pin DIMM socket	DIMM3
DIMM sockets	240-pin DIMM socket	DIMM4
FDD connector	34-pin box header	FDD1
Front panel connector	14-pin header	F_PANEL1
IDE Interface connector	40-pin box header	IDE1
Infrared (IrDA) connector	5-pin header	FIR1
PCIe Mini Card connector	52-pin socket	MINI_PCIE1
PCIe Mini Card LED connector	6-pin header	CN3

Parallel port connector	26-pin box header	LPT1
PCI expansion slots	124-pin PCI slot	PCI1
PCI expansion slots	124-pin PCI slot	PCI2
PCI expansion slots	124-pin PCI slot	PCI3
PCI expansion slots	124-pin PCI slot	PCI4
PCI expansion slots	124-pin PCI slot	PCI5
PCI expansion slots	124-pin PCI slot	PCI6
PCIe x16 expansion slot	164-pin PCIe slot	PCIE1
Power connector	8-pin connector	PWR2
RS-422/485 connector (for COM3)	4-pin header	CN1
Serial ATA drive connector	7-pin SATA	SATA1
Serial ATA drive connector	7-pin SATA	SATA2
Serial ATA drive connector	7-pin SATA	SATA3
Serial ATA drive connector	7-pin SATA	SATA4
Serial port connector (COM3)	10-pin box header	COM3
Serial port connector (COM4)	10-pin box header	COM4
Serial port connector (COM5)	10-pin box header	COM5
Serial port connector (COM6)	10-pin box header	COM6
SPDIF connector	5-pin header	SPDIF1
TPM connector	20-pin header	TPM1
TV Out connector	6-pin header	TV1
USB connector	8-pin header	JUSB1
USB connector	8-pin header	JUSB2

Table 4-1: Peripheral Interface Connectors

4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the IMBA-690AM2. Detailed descriptions of these connectors can be found in **Section 4.3**.

Connector	Type	Label
Audio connector	Audio jack	AUDIO1
DVI and VGA combo connector	DVI and DB-15	VGA/DVI_1
Ethernet and dual USB combo connector	RJ-45 and two USB	LAN/USB1
Ethernet and dual USB combo connector	RJ-45 and two USB	LAN/USB2
Mouse or keyboard connector	PS/2	KB/MS_1
Serial port connector (COM1)	DB-9 (male)	COM1
Serial port connector (COM2)	DB-9 (male)	COM2

Table 4-2: Rear Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the IMBA-690AM2.

4.2.1 Audio Connector (8-pin)

CN Label: AUDIO3

CN Type: 8-pin header (2x4)

CN Location: See Figure 4-2

CN Pinouts: See Table 4-3

The 8-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

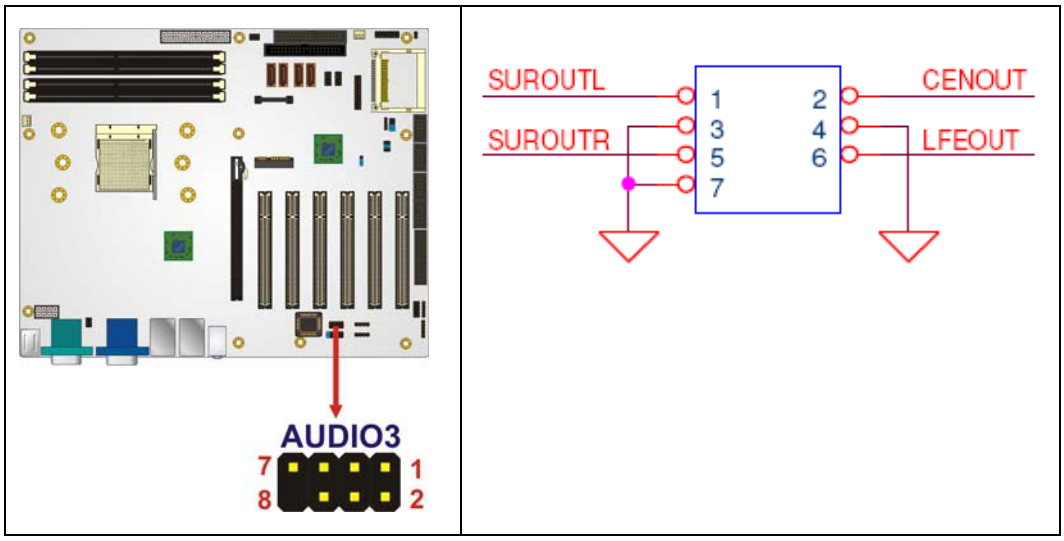


Figure 4-2: Audio Connector Location (9-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SUROUTL	2	CENOUT
3	GND	4	GND
5	SUROUTR	6	LFEOUT
7	GND	8	N/C

Table 4-3: Audio Connector Pinouts (9-pin)

4.2.2 Audio Connector (10-pin)

CN Label: AUDIO2

CN Type: 10-pin header

CN Location: See Figure 4-3

CN Pinouts: See Table 4-4

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

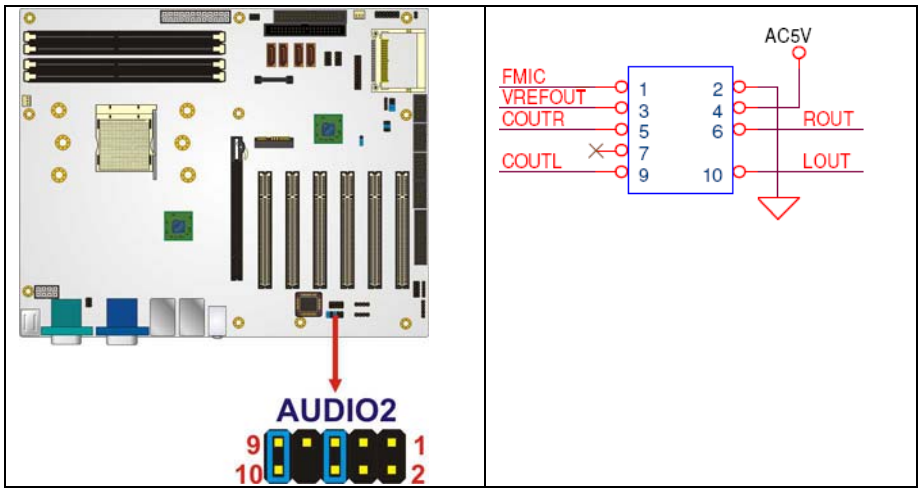


Figure 4-3: Audio Connector Pinouts (10-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	FMIC	2	GND
3	VREFOUT	4	+5V
5	COUTR	6	ROUT
7	N/C	8	N/C
9	COUTL	10	LOUT

Table 4-4: Audio Connector Pinouts (10-pin)

4.2.3 Audio CD In Connector (4-pin)

CN Label: CD_IN1

CN Type: 4-pin header

CN Location: See Figure 4-4

CN Pinouts: See Table 4-5

The 4-pin audio CD in connector is connected to an external audio CD device for the input and output of audio signals from a CD player to the system.

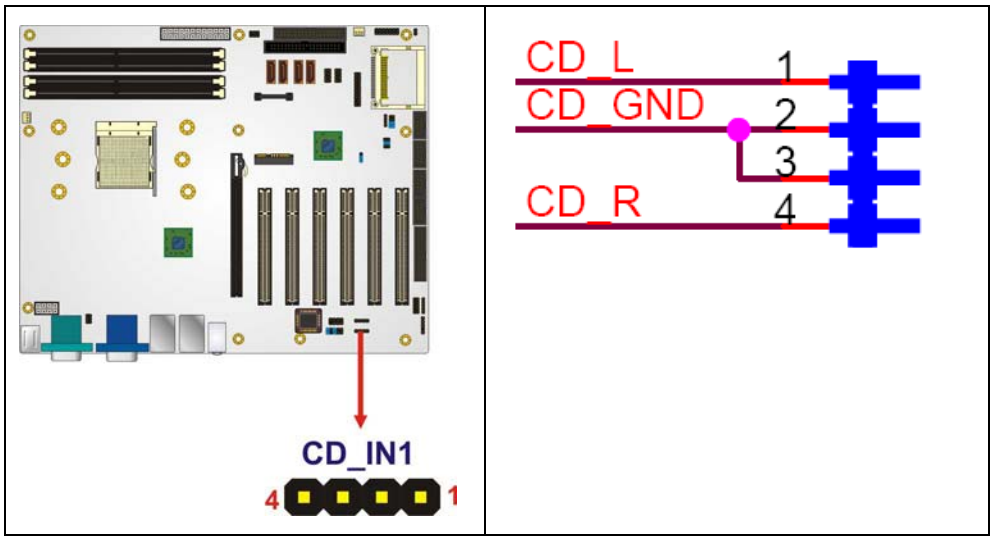


Figure 4-4: Audio CD In Connector Pinouts (4-pin)

PIN NO.	DESCRIPTION
1	CD Signal (Left)
2	Ground
3	Ground
4	CD Signal (Right)

Table 4-5: Audio CD In Connector Pinouts

4.2.4 Auxiliary Audio Connector

CN Label: AUX1

CN Type: 4-pin header

CN Location: See Figure 4-5

CN Pinouts: See Table 4-6

The 4-pin auxiliary audio connector provides a second audio input to the system.

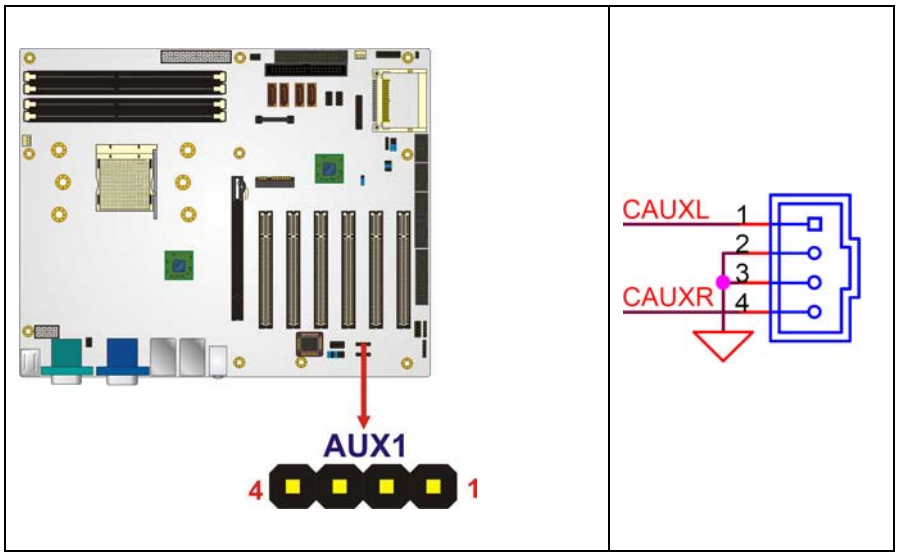


Figure 4-5: Auxiliary Audio Connector Location (4-pin)

PIN	DESCRIPTION
1	CAUXL
2	GND
3	GND
4	CAUXR

Table 4-6: Auxiliary Audio Connector Pinouts (4-pin)

4.2.5 ATX Power Connector

CN Label: PWR1

CN Type: 24-pin ATX (2x10)

CN Location: See Figure 4-6

CN Pinouts: See Table 4-7

The ATX connector is connected to an external ATX power supply. Power is provided to the system, from the power supply through this connector.

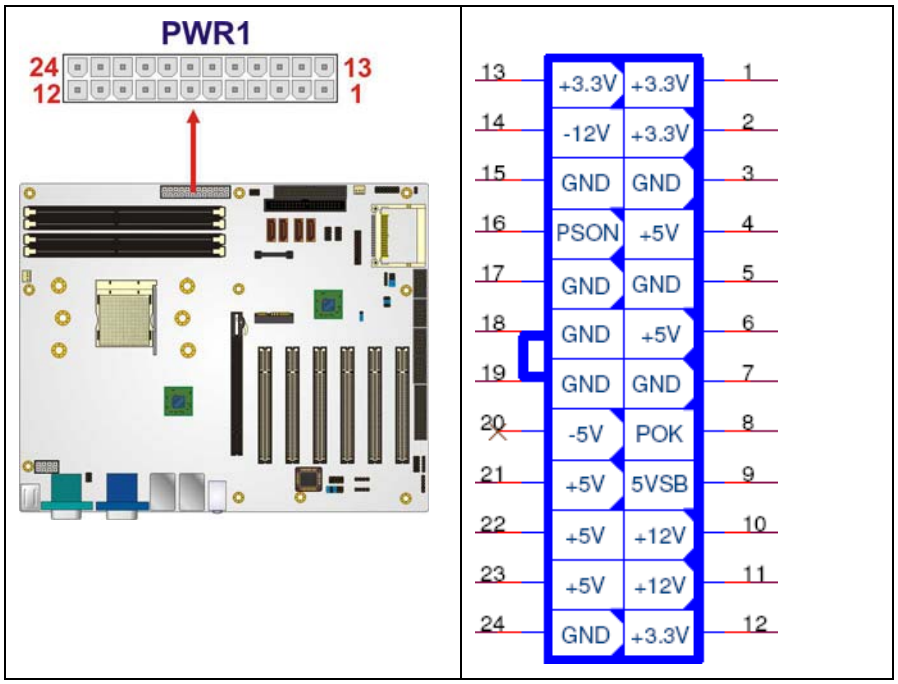


Figure 4-6: ATX Power Connector Pinout Locations

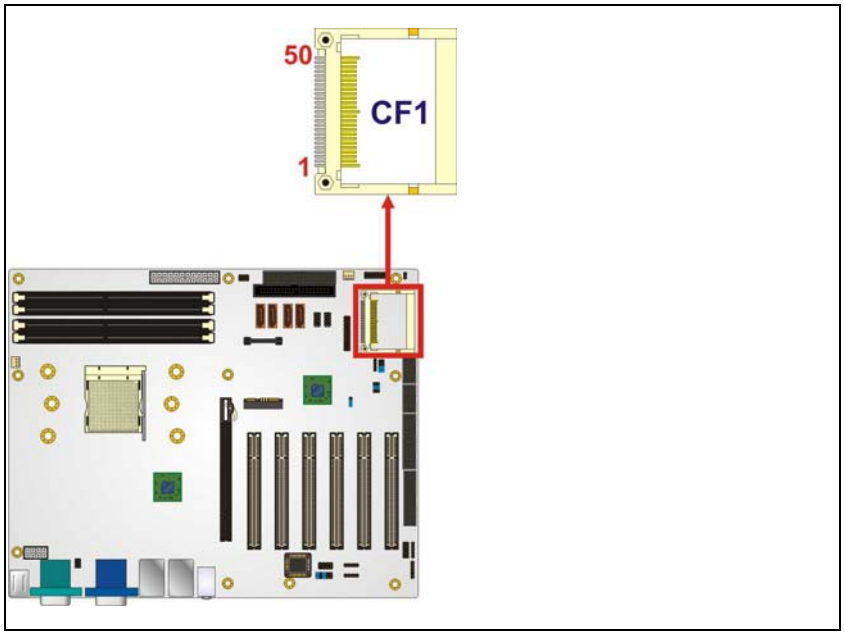
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PSON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	POK	20	-5V(N/C)
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

Table 4-7: ATX Power Connector Pinouts

4.2.6 Compact Flash Socket

CN Label:	CF1
CN Type:	50-pin header (2x25)
CN Location:	See Figure 4-7
CN Pinouts:	See Table 4-8

A CF Type II memory card is inserted to the CF socket on the IMBA-690AM2.



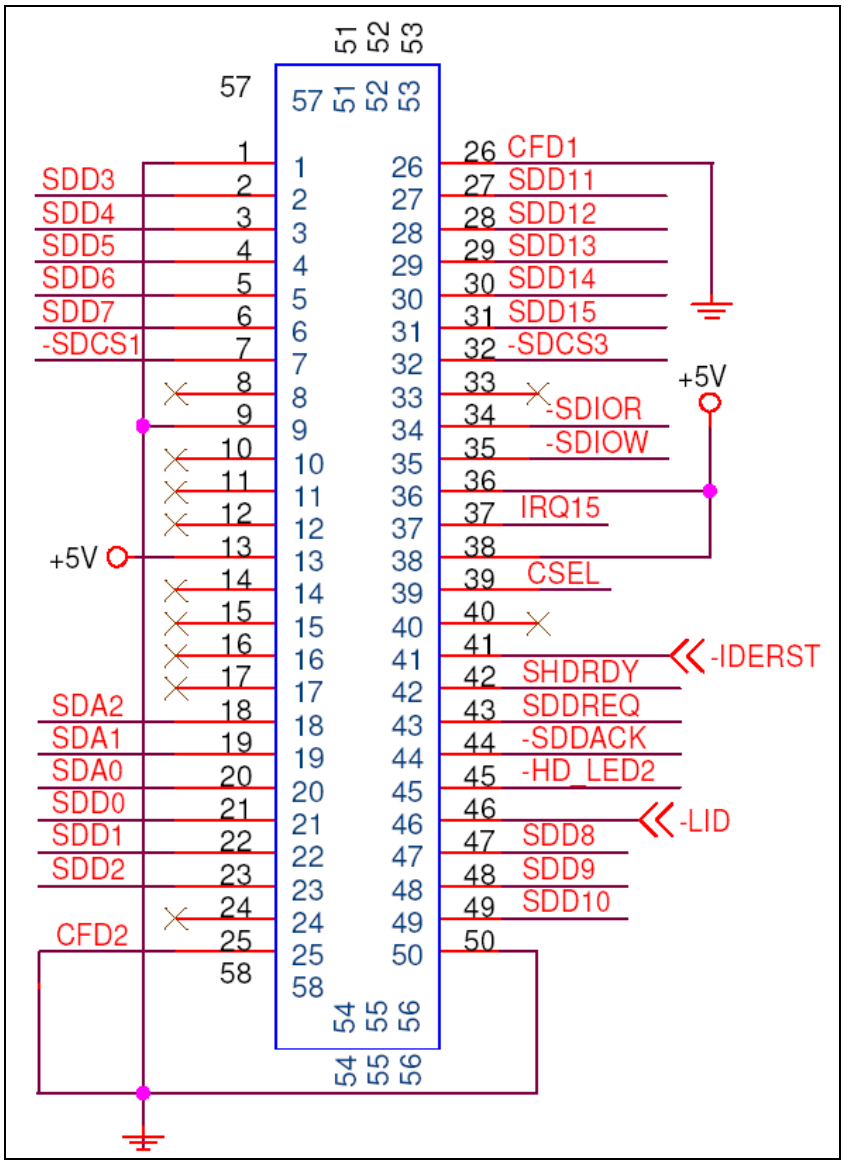


Figure 4-7: CF Card Socket Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15

7	HDC_CS0#	32	HDC_CS1
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	VCC_COM
12	N/C	37	IRQ15
13	VCC_COM	38	VCC_COM
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY
18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	66DET
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 4-8: CF Card Socket Pinouts

4.2.7 Digital Input/Output (DIO) Connector

CN Label: DIO1

CN Type: 10-pin header (2x5)

CN Location: See Figure 4-8

CN Pinouts: See Table 4-9

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

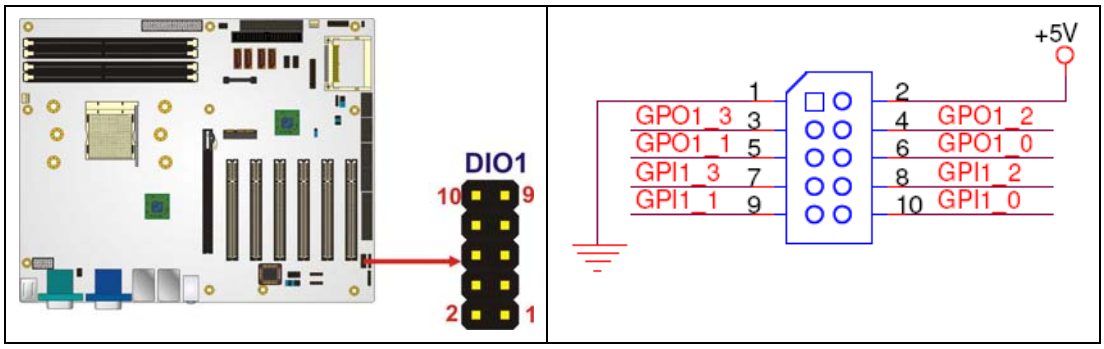


Figure 4-8: DIO Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	GPO1_3	4	GPO1_2
5	GPO1_1	6	GPO1_0
7	GPI1_3	8	GPI1_2
9	GPI1_1	10	GPI1_0

Table 4-9: DIO Connector Pinouts

4.2.8 Fan Connector

CN Label: CPU_FAN1, SYSTEM_FAN1

CN Type: 3-pin header

CN Location: See Figure 4-9

CN Pinouts: See Table 4-10 and **Table 4-11**

The cooling fan connectors provide 12V, 500mA current to a system cooling fan and a CPU cooling fan. The connectors both have a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

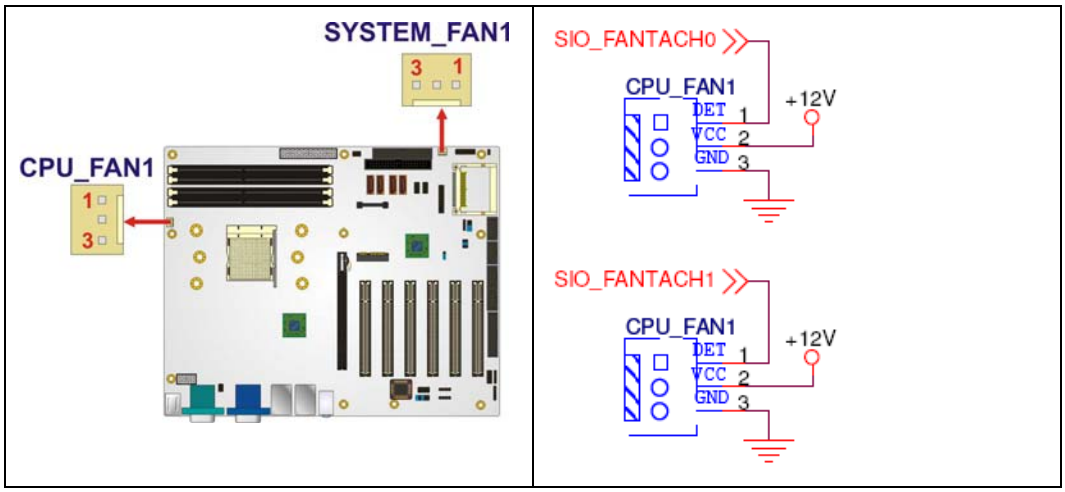


Figure 4-9: Fan Connector Location

PIN NO.	DESCRIPTION
1	SIO_FANTACH0
2	+12V
3	GND

Table 4-10: CPU Fan Connector Pinouts

PIN NO.	DESCRIPTION
1	SIO_FANTACH1
2	+12V
3	GND

Table 4-11: System Fan Connector Pinouts

4.2.9 Floppy Disk Connector (34-pin)

CN Label: FDD1

CN Type: 34-pin header (2x17)

CN Location: See Figure 4-10

CN Pinouts: See Table 4-12

The floppy disk connector is connected to a floppy disk drive.

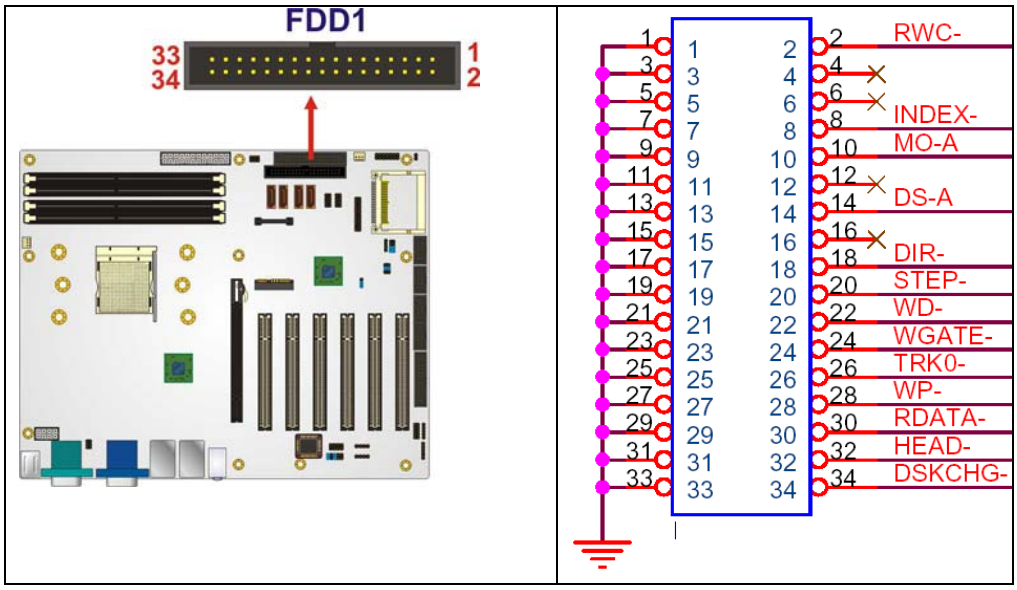


Figure 4-10: 34-pin FDD Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	REDUCE WRITE
3	GND	4	N/C
5	N/C	6	N/C
7	GND	8	INDEX#
9	GND	10	MOTOR ENABLE A#
11	GND	12	DRIVE SELECT B#
13	GND	14	DRIVE SELECT A#
15	GND	16	MOTOR ENABLE B#
17	GND	18	DIRECTION#
19	GND	20	STEP#
21	GND	22	WRITE DATA#
23	GND	24	WRITE GATE#
25	GND	26	TRACK 0#
27	GND	28	WRITE PROTECT#
29	GND	30	READ DATA#
31	GND	32	SIDE 1 SELECT#

33	GND	34	DISK CHANGE#

Table 4-12: 34-pin FDD Connector Pinouts

4.2.10 Front Panel Connector (14-pin)

CN Label: F_PANEL1

CN Type: 14-pin header (2x7)

CN Location: See Figure 4-11

CN Pinouts: See Table 4-13

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power LED
- Speaker
- Power button
- Reset
- HDD LED

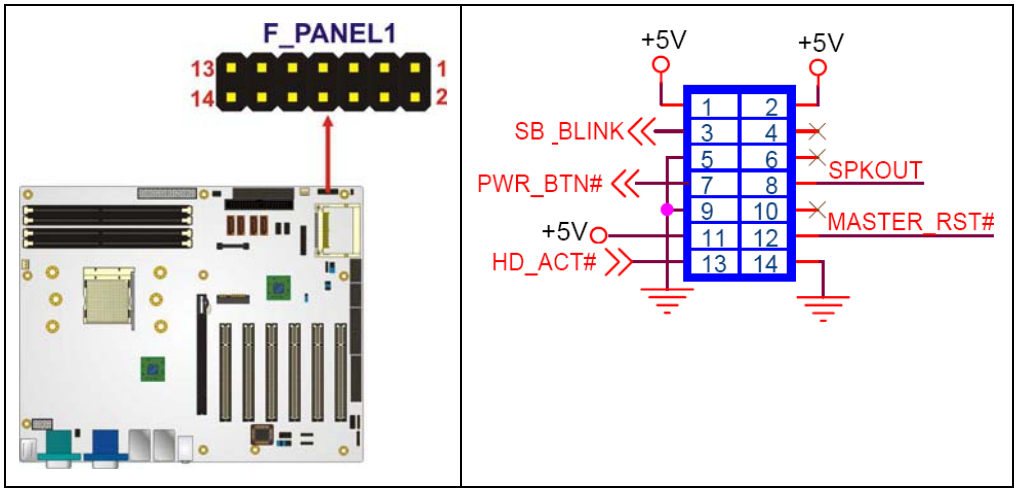


Figure 4-11: Front Panel Connector Pinout Locations (14-pin)

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	LED+	Speaker	2	SPEAKER+
	3	BLINK		4	N/C
	5	LED-		6	N/C
Power Button	7	PWRBTSW+		8	SPEAKER -
	9	GND	Reset	10	N/C
HDD LED	11	IDE LED+		12	RESET+
	13	IDE LED-		14	GND

Table 4-13: Front Panel Connector Pinouts (14-pin)

4.2.11 IDE Connector (40-pin)

CN Label: IDE1

CN Type: 40-pin header (2x20)

CN Location: See Figure 4-12

CN Pinouts: See Table 4-14

One 40-pin IDE device connector on the IMBA-690AM2 supports connectivity to two hard disk drives.

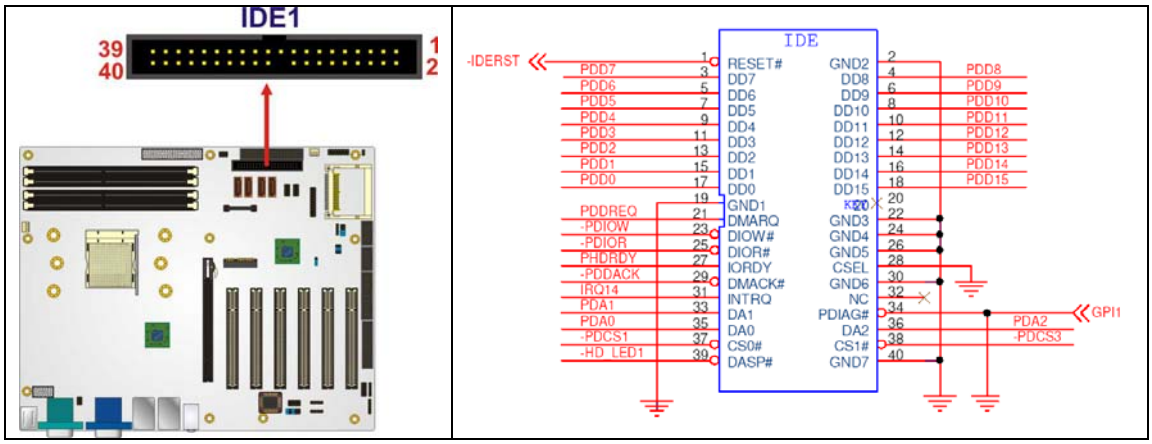


Figure 4-12: IDE Device Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	IDE_RST#	2	GND
3	PDD7	4	PDD8
5	PDD6	6	PDD9
7	PDD5	8	PDD10
9	PDD4	10	PDD11
11	PDD3	12	PDD12
13	PDD2	14	PDD13
15	PDD1	16	PDD14
17	PDD0	18	PDD15
19	GND	20	N/C
21	PDREQ	22	GND
23	PDIOW#	24	GND
25	PDIOR#	26	GND
27	PDIORDY	28	PCSEL
29	PDACK#	30	GND
31	PIDE_INTR	32	N/C
33	PDA1	34	PDMA66
35	PDA0	36	PDA2
37	PDCS1#	38	PDCS3#
39	PIDEATC#	40	GND

Table 4-14: IDE Connector Pinouts

4.2.12 Infrared Interface Connector

CN Label: FIR1

CN Type: 5-pin header (1x5)

CN Location: See Figure 4-13

CN Pinouts: See Table 4-15

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

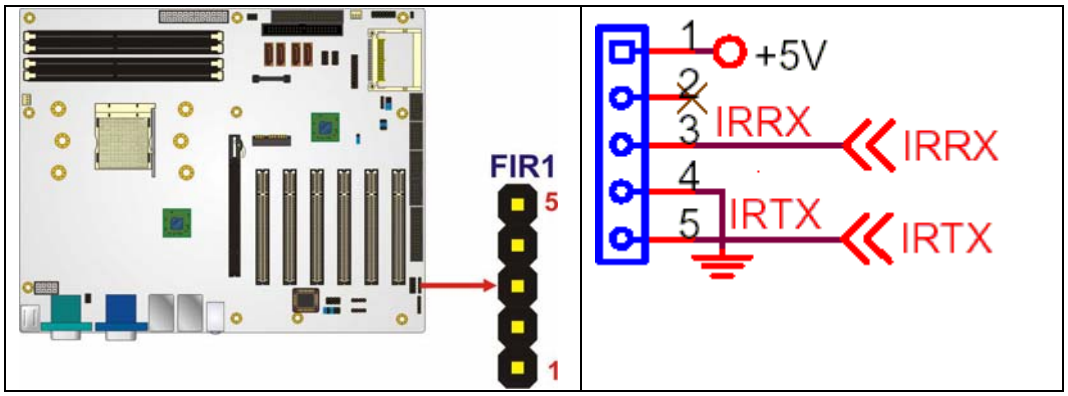


Figure 4-13: Infrared Connector Pinout Locations

PIN NO.	DESCRIPTION
1	VCC5
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 4-15: Infrared Connector Pinouts

4.2.13 PCI Express Mini Card Connector

CN Label: MINI_PCIE1

CN Type: 52-pin PCIe Mini Card Connector

CN Location: See Figure 4-14

CN Pinouts: See Table 4-16

The slot enables a PCI Express Mini Card to be connected to the board.

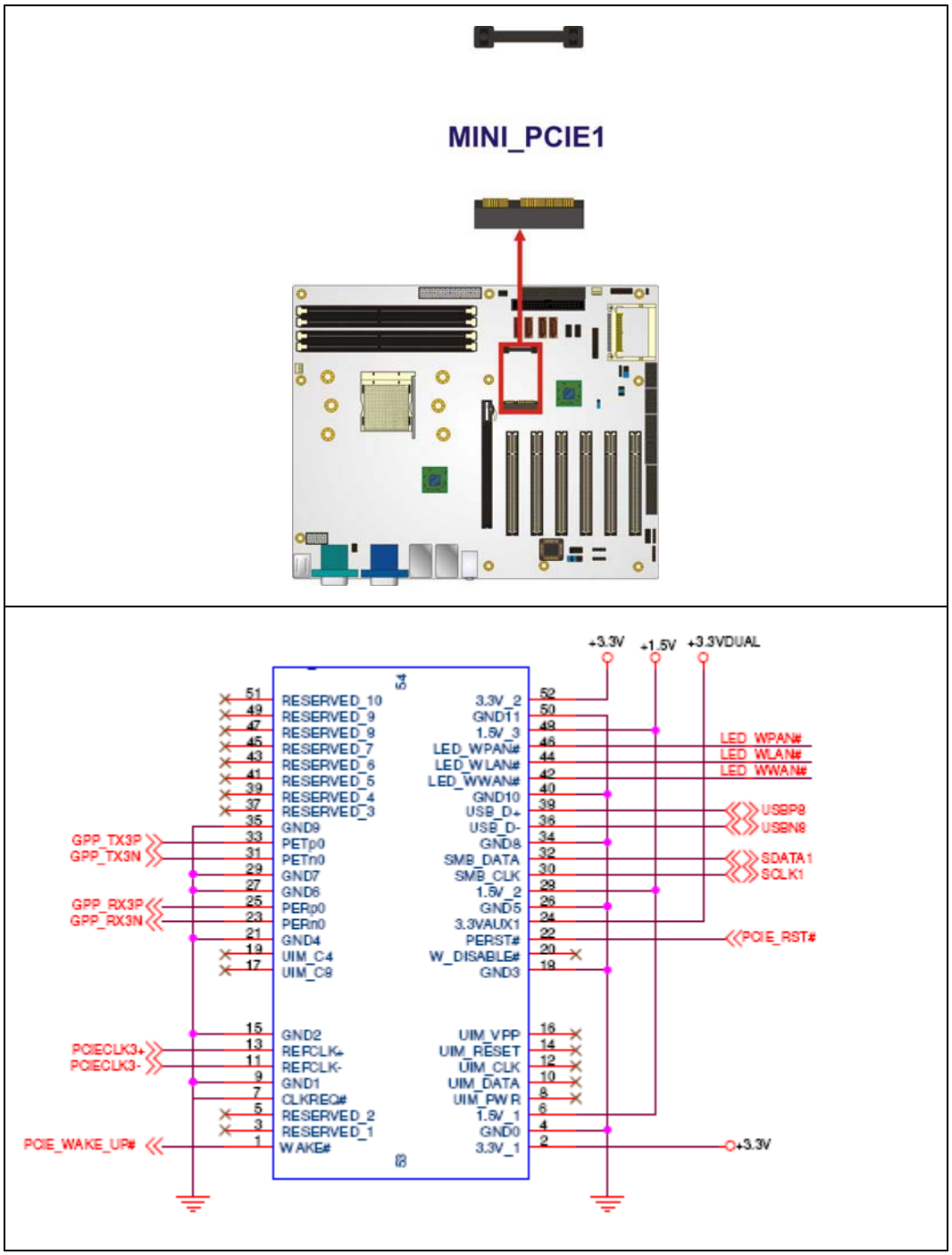


Figure 4-14: PCIe Mini Card Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE_UP#	2	3.3V
3	RESERVED_1	4	GND
5	RESERVED_2	6	1.5V
7	CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DATA
11	PCIECLK3-	12	UIM_CLK
13	PCIECLK3+	14	UIM_RESET
15	GND	16	UIM_VPP
17	UIM_C8	18	GND
19	UIM_C4	20	NC
21	GND	22	PCIE_RST#
23	GPP_RX3N	24	3.3VAUX
25	GPP_RX3P	26	GND
27	GND	28	1.5V
29	GND	30	SCLK
31	GPP_TX3N	32	SDATA1
33	GPP_TX3P	34	GND
35	GND	36	USBN8
37	RESERVED_3	38	USBP8
39	RESERVED_4	40	GND
41	RESERVED_5	42	LED_WWAN#
43	RESERVED_6	44	LED_WLAN#
45	RESERVED_7	46	LED_WPAN#
47	RESERVED_8	48	1.5V
49	RESERVED_9	50	GND
51	RESERVED_10	52	3.3V

Table 4-16: PCIe Mini Card Connector Pinouts

4.2.14 PCIe Mini Card LED Connector

CN Label: CN3

CN Type: 6-pin header (2x3)

CN Location: See Figure 4-15

CN Pinouts: See Table 4-17

The PCIe Mini Card LED connector is for the indicator LED of the PCIe Mini Card.

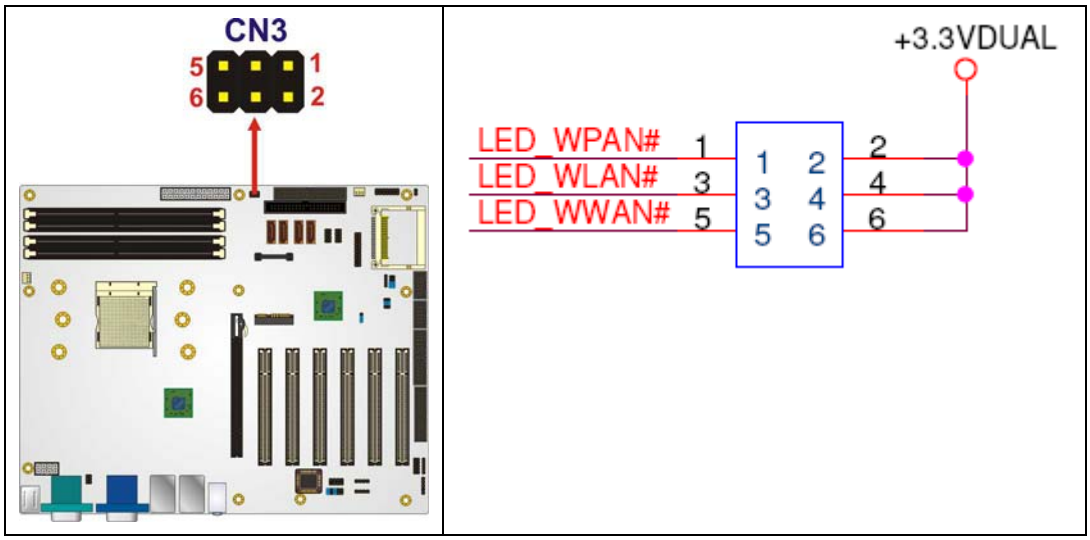


Figure 4-15: PCIe Mini Card LED Connector Location

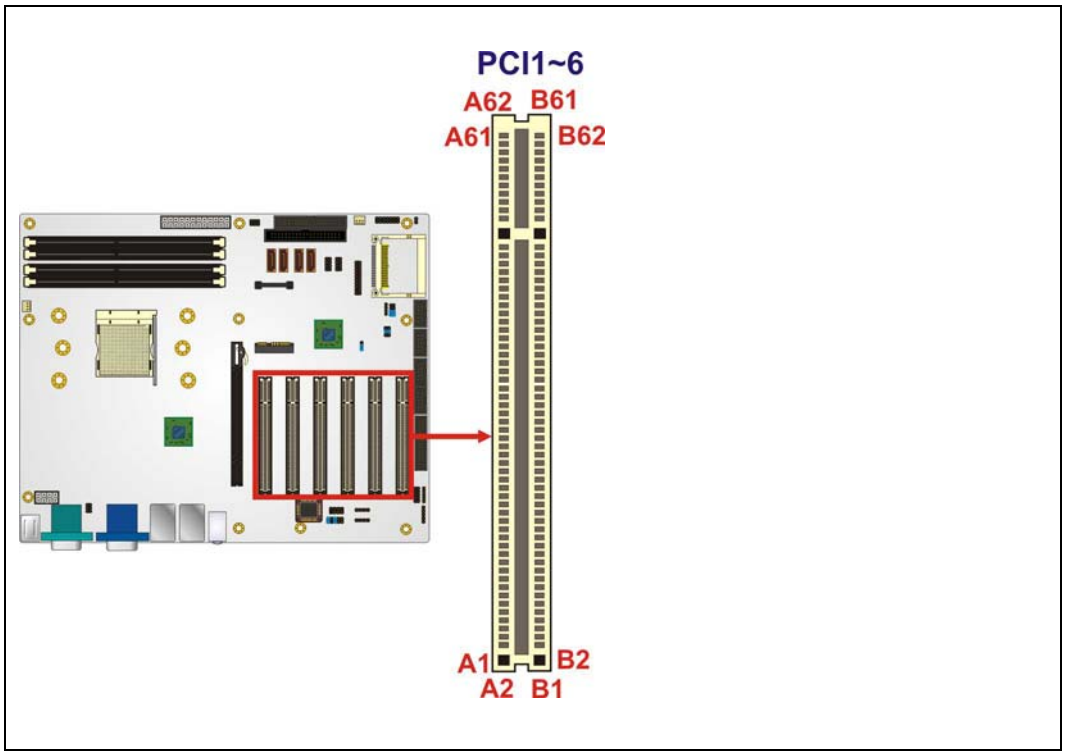
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LED_WPAN#	2	+3.3VDUAL
3	LED_WLAN#	4	+3.3VDUAL
5	LED_WWAN#	6	+3.3VDUAL

Table 4-17: PCIe Mini Card LED Connector Pinouts

4.2.15 PCI Slot

CN Label:	PCI1, PCI2, PCI3, PCI4, PCI5, PCI6
CN Type:	PCI Slot
CN Location:	See Figure 4-16
CN Pinouts:	See Table 4-18

The PCI slot enables a PCI expansion module to be connected to the board.



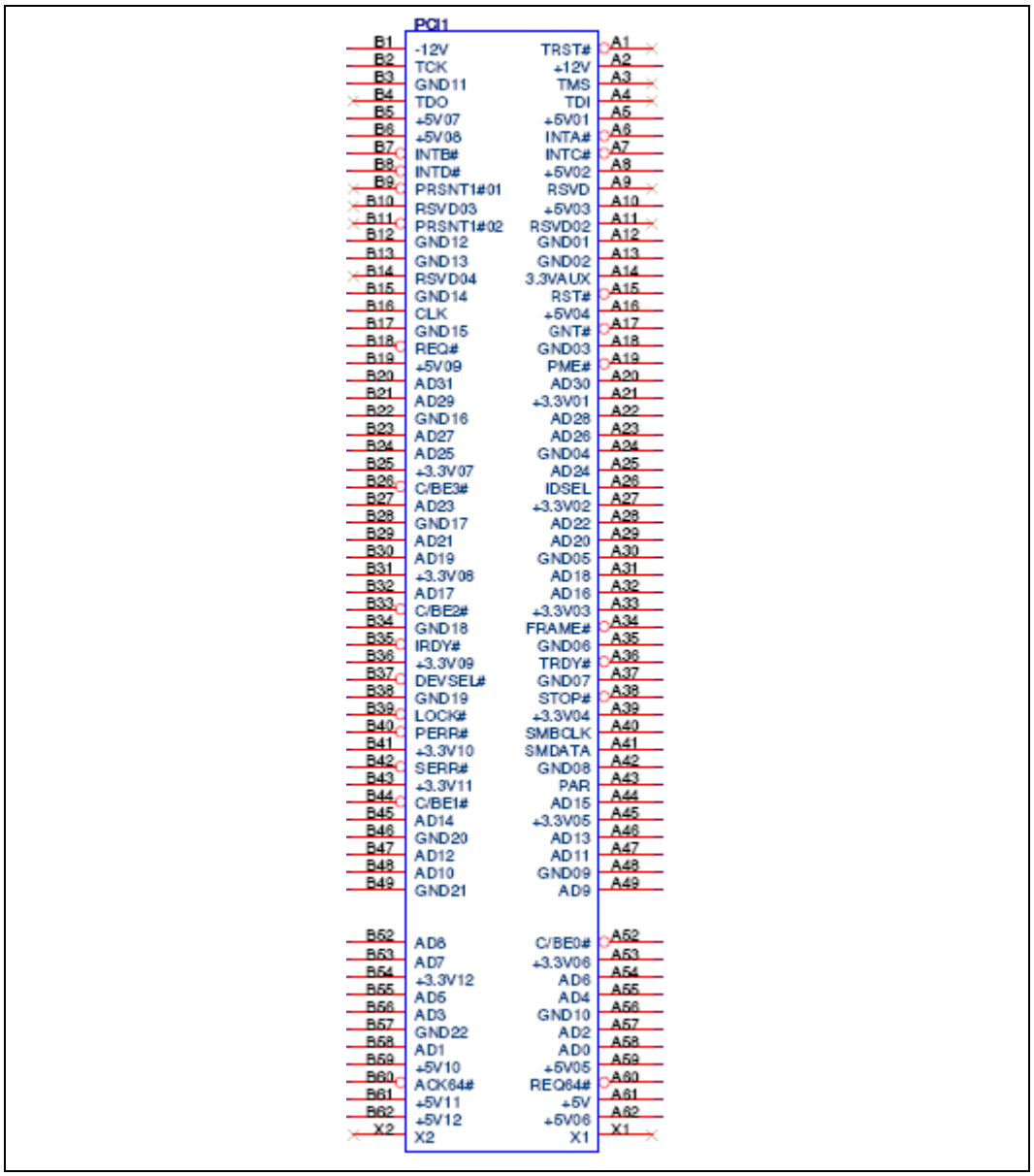


Figure 4-16: PCI Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	TRST	B1	-12V
A2	+12V	B2	TCK
A3	TMS	B3	GND
A4	TDI	B4	TDO

A5	+5V	B5	+5V
A6	INTA	B6	+5V
A7	INTC	B7	INTB
A8	+5V	B8	INTD
A9	RESERVED3	B9	PRSNT1
A10	+5V	B10	RESERVED1
A11	RESERVED4	B11	PRSNT2
A12	GND	B12	GND
A13	GND	B13	GND
A14	3.3V_AUX	B14	RESERVED2
A15	RST	B15	GND
A16	+5V	B16	CLK
A17	GNT	B17	GND
A18	GND	B18	REQ
A19	PME	B19	+5V
A20	AD30	B20	AD31
A21	+3.3V	B21	AD29
A22	AD28	B22	GND
A23	AD26	B23	AD27
A24	GND	B24	AD25
A25	AD24	B25	+3.3V
A26	IDSEL	B26	C/BE3
A27	+3.3V	B27	AD23
A28	AD22	B28	GND
A29	AD20	B29	AD21
A30	GND	B30	AD19
A31	AD18	B31	+3.3V
A32	AD16	B32	AD17
A33	+3.3V	B33	C/BE2
A34	FRAME	B34	GND
A35	GND	B35	IRDY
A36	TRDY	B36	+3.3V

A37	GND	B37	DEVSEL
A38	STOP	B38	GND
A39	+3.3V	B39	LOCK
A40	SDONE	B40	PERR
A41	SBO	B41	+3.3V
A42	GND	B42	SERR
A43	PAR	B43	+3.3V
A44	AD15	B44	C/BE1
A45	+3.3V	B45	AD14
A46	AD13	B46	GND
A47	AD11	B47	AD12
A48	GND	B48	AD10
A49	AD9	B49	GND
A52	C/BE0	B52	AD8
A53	+3.3V	B53	AD7
A54	AD6	B54	+3.3V
A55	AD4	B55	AD5
A56	GND	B56	AD3
A57	AD2	B57	GND
A68	AD0	B68	AD1
A59	+5V	B59	+5V
A60	REQ64	B60	ACK64
A61	+5V	B61	+5V
A62	+5V	B62	+5V

Table 4-18: PCI Slot

4.2.16 PCI Express x16 Slot

CN Label: PCIE1

CN Type: 164-pin PCIe x16 slot

CN Location: See Figure 4-17

CN Pinouts: See Table 4-20

PCIe x16 expansion devices can be inserted into the PCIe x16 slots.

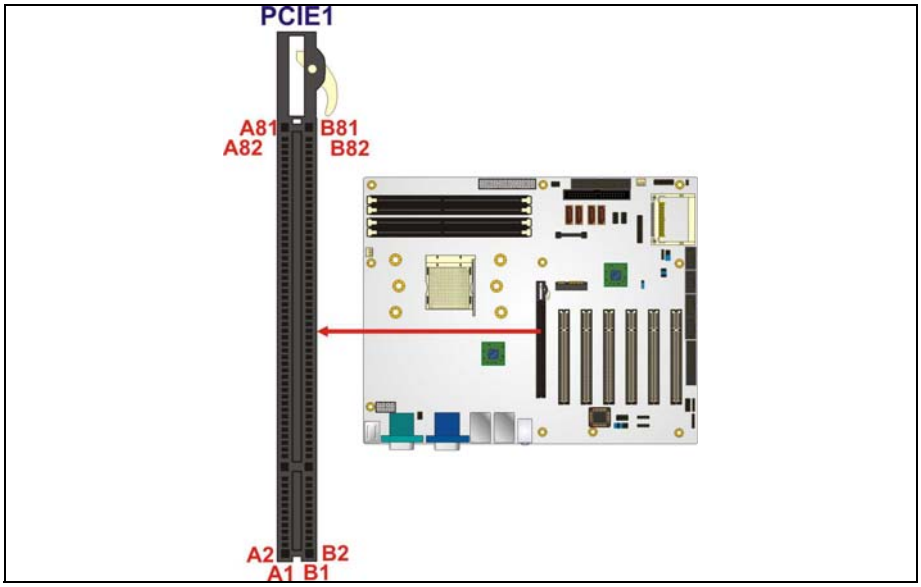


Figure 4-17: PCI Express x16 Slot Locations

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
A1	PRSNT#1	A22	HSIn(1)	A43	HSIp(6)	A64	HSIp(11)
A2	+12v	A23	GND	A44	HSIn(6)	A65	HSIn(11)
A3	+12v	A24	GND	A45	GND	A66	GND
A4	GND	A25	HSIp(2)	A46	GND	A67	GND
A5	JTAG2	A26	HSIn(2)	A47	HSIp(7)	A68	HSIp(12)
A6	JTAG3	A27	GND	A48	HSIn(7)	A69	HSIn(12)
A7	JTAG4	A28	GND	A49	GND	A70	GND
A8	JTAG5	A29	HSIp(3)	A50	RSVD	A71	GND
A9	+3.3v	A30	HSIn(3)	A51	GND	A72	HSIp(13)
A10	+3.3v	A31	GND	A52	HSIp(8)	A73	HSIn(13)
A11	PWRGD	A32	RSVD	A53	HSIn(8)	A74	GND
A12	GND	A33	RSVD	A54	GND	A75	GND
A13	REFCLK+	A34	GND	A55	GND	A76	HSIp(14)
A14	REFCLK-	A35	HSIp(4)	A56	HSIp(9)	A77	HSIn(14)

A15	GND	A36	HSIn(4)	A57	HSIn(9)	A78	GND
A16	HSIp(0)	A37	GND	A58	GND	A79	GND
A17	HSIn(0)	A38	GND	A59	GND	A80	HSIp(15)
A18	GND	A39	HSIp(5)	A60	HSIp(10)	A81	HSIn(15)
A19	RSVD	A40	HSIn(5)	A61	HSIn(10)	A82	GND
A20	GND	A41	GND	A62	GND		
A21	HSIp(1)	A42	GND	A63	GND		

Table 4-19: PCIe x16 Side A Pinouts

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
B1	+12v	B22	GND	B43	GND	B64	GND
B2	+12v	B23	HSOp(2)	B44	GND	B65	GND
B3	RSVD	B24	HSOn(2)	B45	HSOp(7)	B66	HSOp(12)
B4	GND	B25	GND	B46	HSOn(7)	B67	HSOn(12)
B5	SMCLK	B26	GND	B47	GND	B68	GND
B6	SMDAT	B27	HSOp(3)	B48	PRSNT#2	B69	GND
B7	GND	B28	HSOn(3)	B49	GND	B70	HSOp(13)
B8	+3.3v	B29	GND	B50	HSOp(8)	B71	HSOn(13)
B9	JTAG1	B30	RSVD	B51	HSOn(8)	B72	GND
B10	3.3Vaux	B31	PRSNT#2	B52	GND	B73	GND
B11	WAKE#	B32	GND	B53	GND	B74	HSOp(14)
B12	RSVD	B33	HSOp(4)	B54	HSOp(9)	B75	HSOn(14)
B13	GND	B34	HSOn(4)	B55	HSOn(9)	B76	GND
B14	HSOp(0)	B35	GND	B56	GND	B77	GND
B15	HSOn(0)	B36	GND	B57	GND	B78	HSOp(15)
B16	GND	B37	HSOp(5)	B58	HSOp(10)	B79	HSOn(15)
B17	PRSNT#2	B38	HSOn(5)	B59	HSOn(10)	B80	GND
B18	GND	B39	GND	B60	GND	B81	PRSNT#2
B19	HSOp(1)	B40	GND	B61	GND	B82	RSVD#2
B20	HSOn(1)	B41	HSOp(6)	B62	HSOp(11)		
B21	GND	B42	HSOn(6)	B63	HSOn(11)		

Table 4-20: PCI Express x16 Slot Pinouts

4.2.17 Power Connector

CN Label: PWR2

CN Type: 8-pin connector (2x4)

CN Location: See Figure 4-18

CN Pinouts: See Table 4-21

The connector supports the 12V power supply.

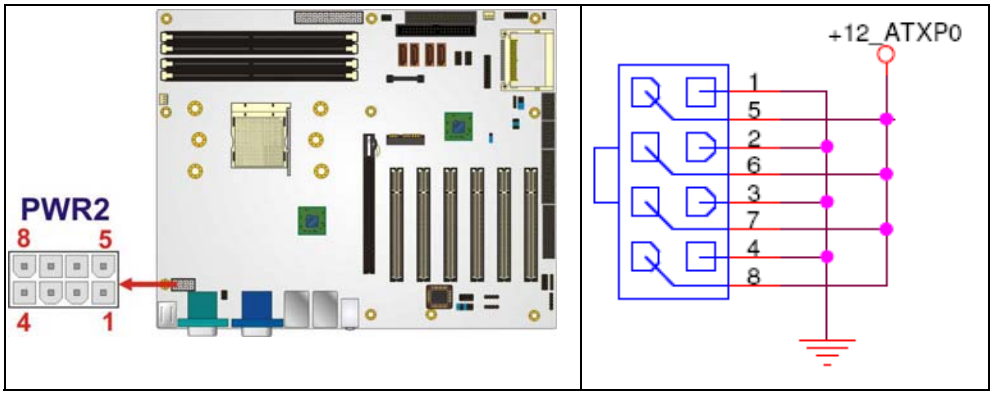


Figure 4-18: Power Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	+12_ATXP0
2	GND	6	+12_ATXP0
3	GND	7	+12_ATXP0
4	GND	8	+12_ATXP0

Table 4-21: Power Connector Pinouts

4.2.18 Parallel Port Connector

CN Label: LPT1

CN Type: 26-pin box header

CN Location: See Figure 4-19

CN Pinouts: See Table 4-22

The 26-pin parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.

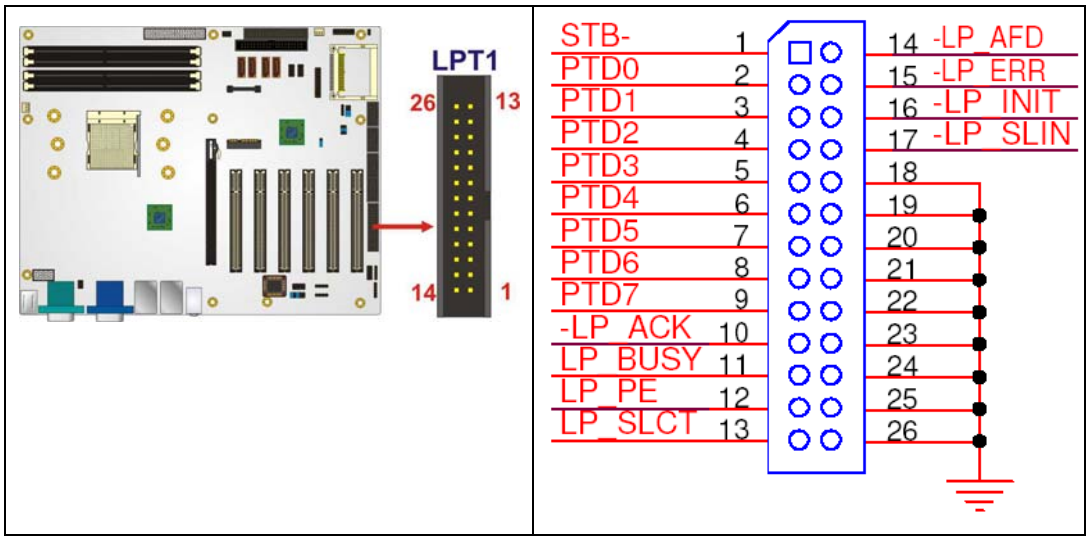


Figure 4-19: Parallel Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STB#	14	LP_AFD#
2	PTD0	15	LP_ERR#
3	PTD1	16	LP_INIT#
4	PTD2	17	LP_SLIN#
5	PTD3	18	GND
6	PTD4	19	GND
7	PTD5	20	GND
8	PTD6	21	GND
9	PTD7	22	GND
10	LP_ACK#	23	GND
11	LP_BUSY	24	GND
12	LP_PE	25	GND
13	LP_SLCT	26	GND

Table 4-22: Parallel Port Connector Pinouts

4.2.19 RS-422/485 Connector (for COM3)

CN Label: CN1

CN Type: 4-pin header (1x4)

CN Location: See **Figure 4-20**

CN Pinouts: See Table 4-23

The CN1 connector along with COM3 serial port connector connects to an RS-422, or RS-485 serial port devices.

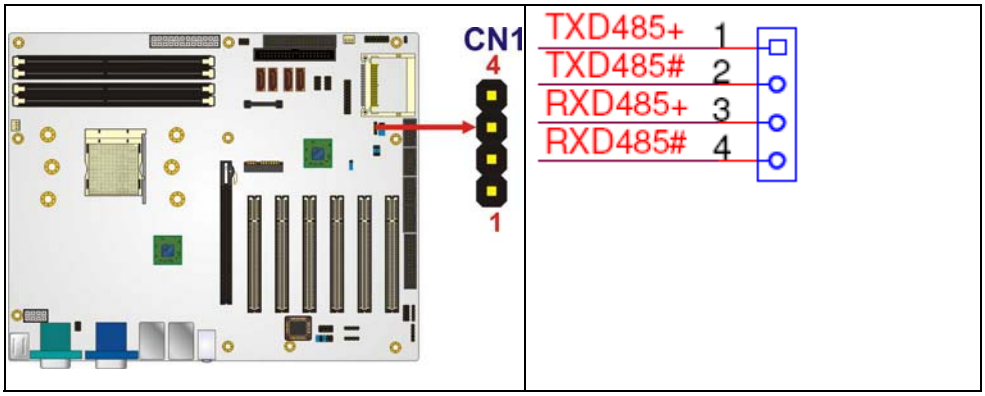


Figure 4-20: RS-422/485 Connector Location

PIN NO.	DESCRIPTION
1	TXD485+
2	TXD485#
3	RXD485+
4	RXD485#

Table 4-23: RS-422/485 Connector Pinouts

4.2.20 SATA Drive Connectors

CN Label: SATA1, SATA2, SATA3, and SATA4

CN Type: 7-pin SATA drive connectors

CN Location: See Figure 4-21

CN Pinouts: See Table 4-24

The two SATA drive connectors are each connected to a SATA II drive. A SATA II drive transfer data at speeds as high as 3.0Gb/s. The SATA drives can be configured in a RAID configuration.

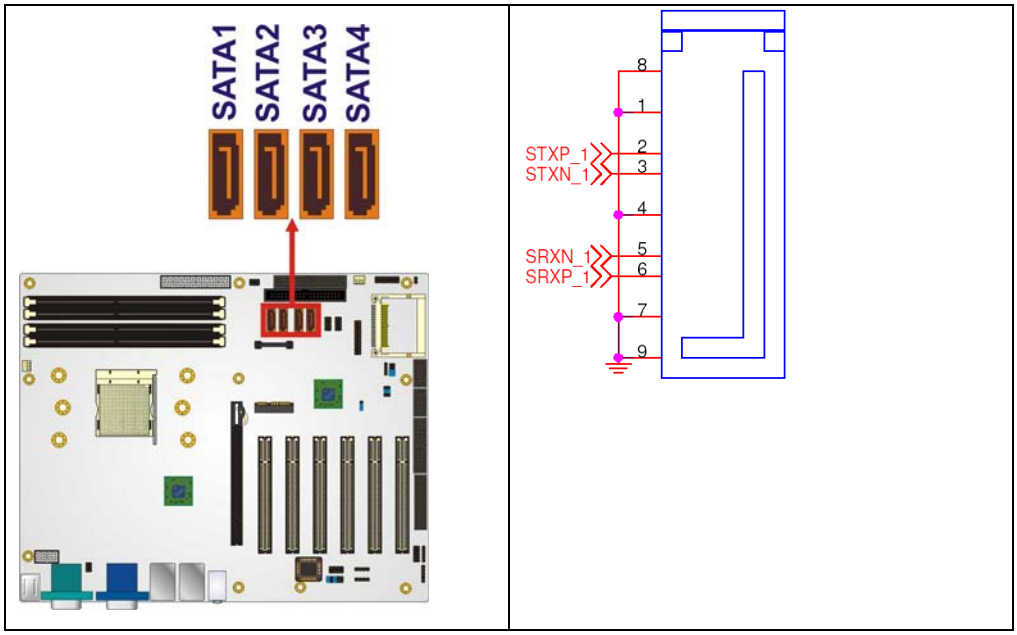


Figure 4-21: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 4-24: SATA Drive Connector Pinouts

4.2.21 Serial Port Connectors

CN Label:	COM3, COM4, COM5, COM6
CN Type:	10-pin header (2x5)
CN Location:	See Figure 4-22
CN Pinouts:	See Table 4-25

The 10-pin serial port connector provides a second RS-232 serial communications channel. The COM 4 serial port connector can be connected to external RS-232 serial port devices.

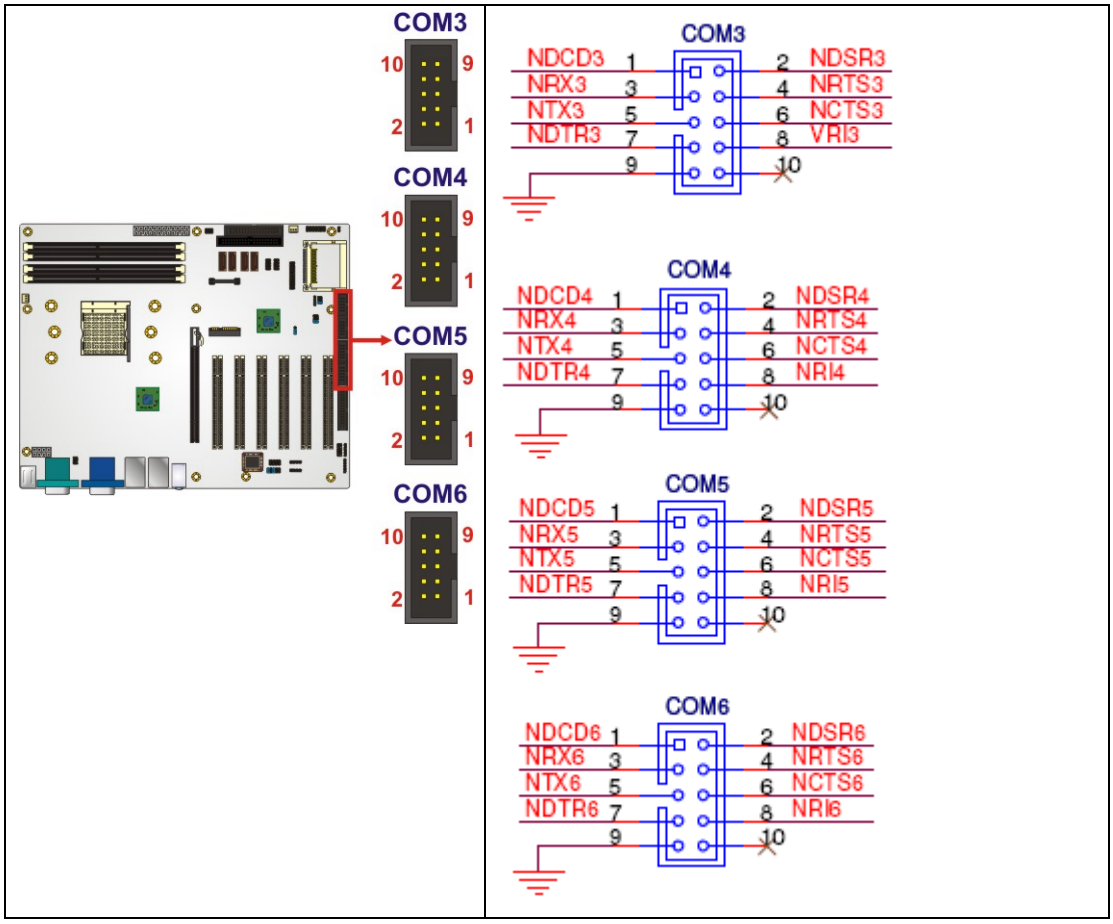


Figure 4-22: Serial Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Direct (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request To Send (RTS)
5	Transmit Data (TXD)	6	Clear To Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	N/C

Table 4-25: Serial Connector Pinouts

4.2.22 SPDIF Connector

CN Label: SPDIF1

CN Type: 5-pin header

CN Location: See Figure 4-23

CN Pinouts: See Table 4-26

Use the SPDIF connector to connect digital audio devices to the system.

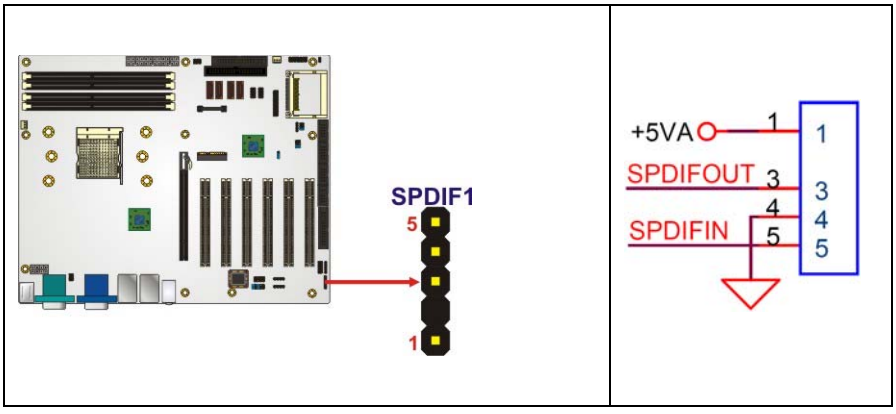


Figure 4-23: SPDIF Connector Pinout Locations

PIN	DESCRIPTION
1	VCC AUDIO
2	NC
3	SPDIF OUT
4	GND AUDIO
5	SPDIF IN

Table 4-26: SPDIF Connector Pinouts

4.2.23 Trusted Platform Module (TPM) Connector

CN Label: TPM1

CN Type: 20-pin header (2x10)

CN Location: See Figure 4-24

CN Pinouts: See Table 4-27

The Trusted Platform Module (TPM) connector secures the system on bootup. An optional TPM (see packing list in **Chapter 3**) can be connected to the TPM connector.

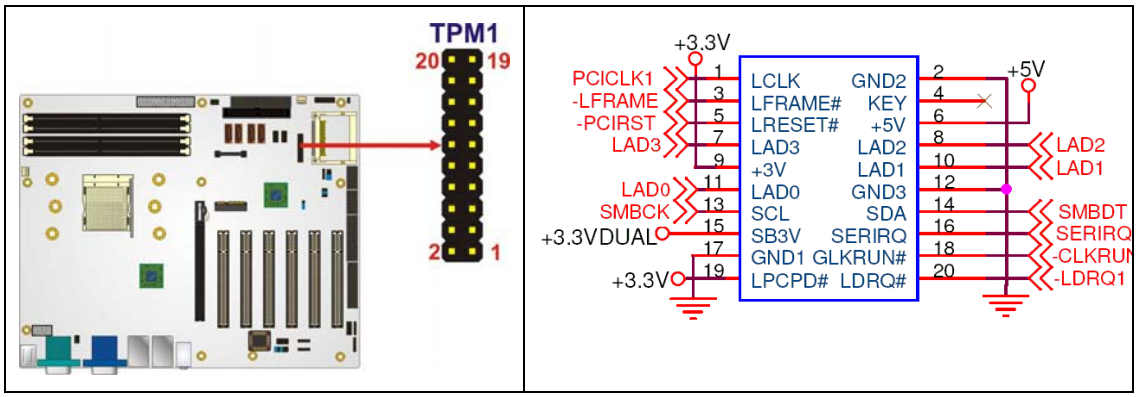


Figure 4-24: TPM Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TPM_CLK	2	GND
3	LFRAME#	4	KEY(N/C)
5	LPC_RST#	6	+5V
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SCLK	14	SDATA
15	+3.3VDUAL	16	SERIRQ
17	GND	18	GND
19	+3.3V	20	LDRQ#1

Table 4-27: TPM Connector Pinouts

4.2.24 TV Out Connector

CN Label: TV1

CN Type: 6-pin header (2x3)

CN Location: See Figure 4-25

CN Pinouts: See Table 4-28

The 2x3 pin TV out connector connects to a TV output by using an S-Video or RCA connector. The TV out connector makes displaying media data on a television easier.

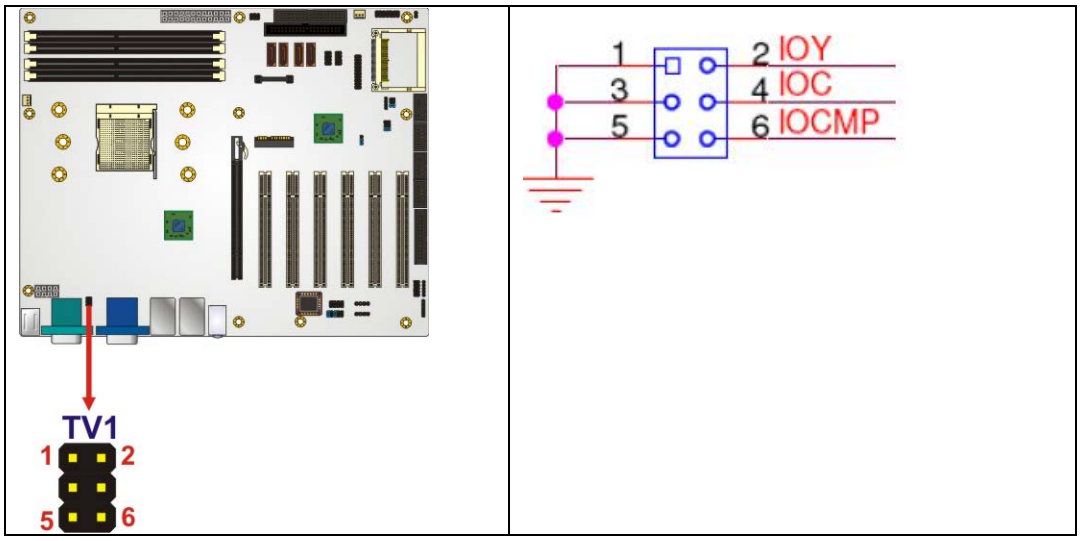


Figure 4-25: TV Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	IOY
3	GND	4	IOC
5	GND	6	IOCMP

Table 4-28: TV Port Connector Pinouts

4.2.25 USB Connectors (Internal)

CN Label: JUSB1 and JUSB2

CN Type: 8-pin header (2x4)

CN Location: See Figure 4-26

CN Pinouts: See Table 4-29 and Table 4-30

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

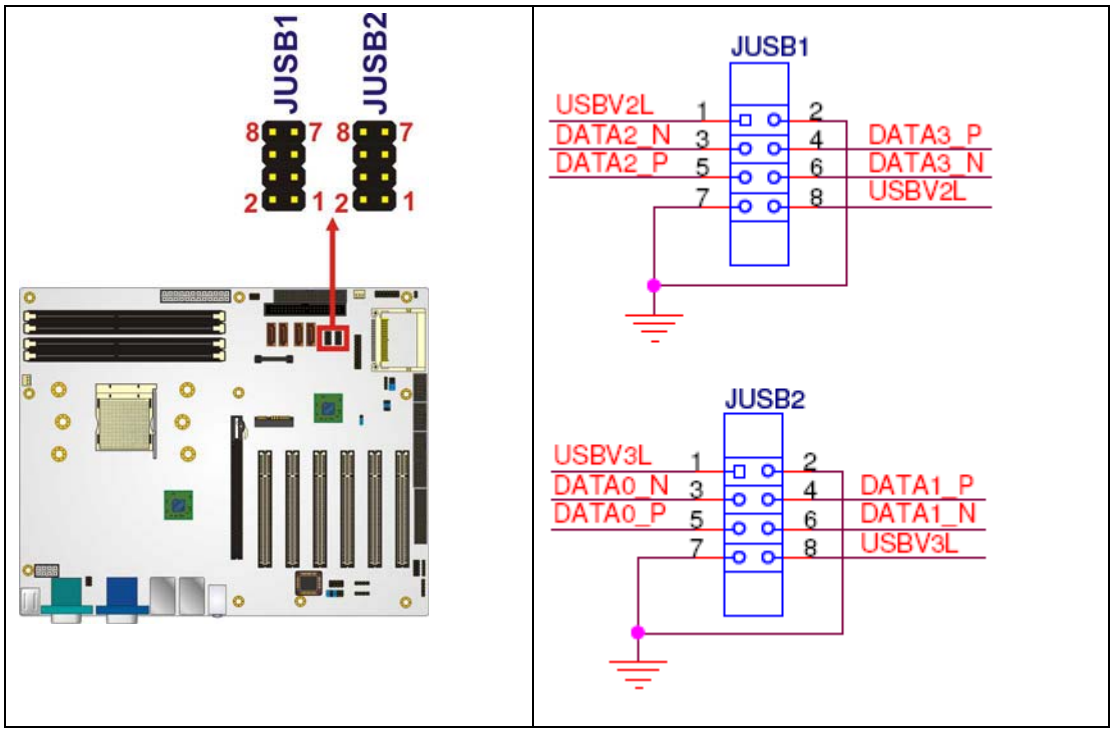


Figure 4-26: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBV2L	2	GND
3	DATA2_N	4	DATA3_P
5	DATA2_P	6	DATA3_N
7	GND	8	USBV2L

Table 4-29: JUSB1 Port Connector Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBV3L	2	GND
3	DATA0_N	4	DATA1_P
5	DATA0_P	6	DATA1_N
7	GND	8	USBV3L

Table 4-30: JUSB2 Port Connector Pinouts

4.3 External Peripheral Interface Connector Panel

Figure 4-27 shows the IMBA-690AM2 external peripheral interface connector (EPIC) panel. The IMBA-690AM2 EPIC panel consists of the following:

- 3 x Audio jack connectors
- 1 x DVI connector
- 2 x PS/2 connectors
- 2 x RJ-45 LAN connectors
- 2 x RS-232 serial port connectors
- 4 x USB 2.0 connectors
- 1 x VGA connector

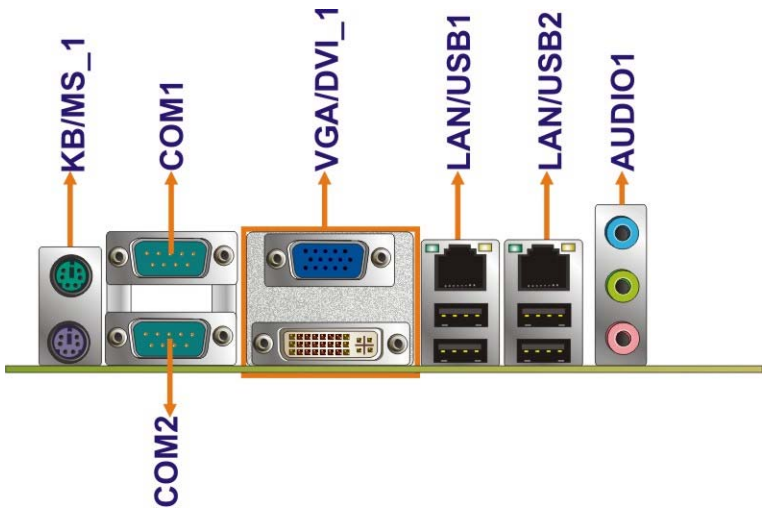


Figure 4-27: IMBA-690AM2 External Peripheral Interface Connector

4.3.1 Audio Connector

CN Label: AUDIO1

CN Type: 3 x audio jacks

CN Location: See Figure 4-27

The three audio jacks on the external audio connector enable the IMBA-690AM2 to be connected to external audio devices as specified below.

- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.
- **Line Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.

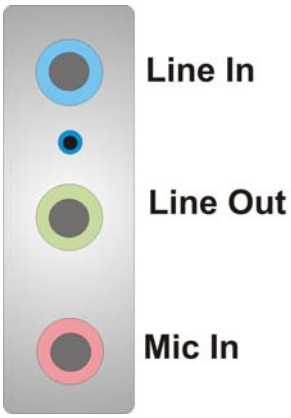


Figure 4-28: Audio Connector

4.3.2 DVI and VGA Combo Connector

CN Label:	VGA/DVI_1
CN Type:	DVI-D and DB-15
CN Location:	See Figure 4-27
CN Pinouts:	See Table 4-31 (DVI-D)

A 24-pin Digital Visual Interface (DVI) connector and a female DB-15 VGA connector are integrated into a single EPIC connector as shown in **Figure 4-27**.

The DVI connector connects to high-speed, high-resolution digital displays. The DVI-D connector supports both digital and analog signals. The connector is show in **Figure 4-29** and the pinouts are shown in **Table 4-31**.

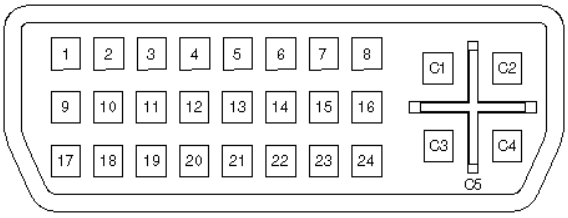


Figure 4-29: DVI-D Connector Pinouts

PIN	Signal Name	PIN	Signal Name	PIN	Signal Name
1	TMDS Data2-	9	TMDS Data1-	17	TMDS Data0-
2	TMDS Data2+	10	TMDS Data1+	18	TMDS Data0+
3	GND	11	GND	19	GND
4	N/C	12	NC	20	NC
5	N/C	13	NC	21	NC
6	DDC Clock [SCL]	14	PVDD1	22	GND
7	DDC Data [SDA]	15	GND	23	TMDS Clock +
8	Analog vertical sync	16	GND	24	TMDS Clock -
C1	N/C	--	--	--	--
C2	N/C	--	--	--	--
C3	N/C	--	--	--	--
C4	N/C	--	--	--	--
C5	N/C	--	--	--	--

Table 4-31: DVI-D Connector Pinouts

The female DB-15 VGA connector connects to standard VGA displays. The connector is show in **Figure 4-30** and the pinouts are shown in **Table 4-32**.

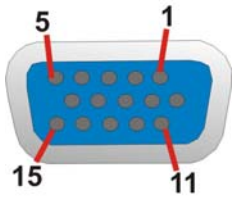


Figure 4-30: VGA Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC / NC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 4-32: VGA Connector Pinouts

4.3.3 Keyboard/Mouse Connector

CN Label: KB/MS_1

CN Type: Dual PS/2

CN Location: See Figure 4-27

CN Pinouts: See Figure 4-31 and Table 4-33

The IMBA-690AM2 keyboard and mouse connectors are standard PS/2 connectors.

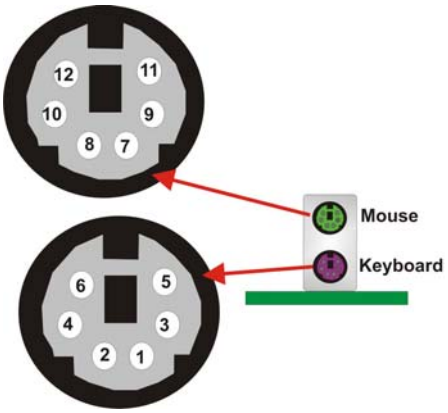


Figure 4-31: PS/2 Pinouts

PIN	DESCRIPTION
1	DATA
2	NC
3	GND
4	VCC5
5	CLK
6	NC

Table 4-33: PS/2 Connector Pinouts

4.3.4 LAN and Dual USB Combo Connectors

CN Label: LAN/USB1 and LAN/USB2

CN Type: RJ-45 and two USB

CN Location: See Figure 4-27

CN Pinouts: See Table 4-34 and Table 4-36

The IMBA-690AM2 is equipped with two built-in RJ-45 GbE controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	X0+	2	X0-
3	X1+	4	X2+
5	X2-	6	X1-
7	X3+	8	X3-

Table 4-34: LAN Pinouts

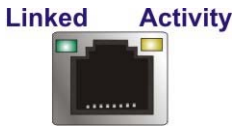


Figure 4-32: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 4-35**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
ORANGE	GbE LAN	YELLOW	Activity
GREEN	10/100 LAN		

Table 4-35: RJ-45 Ethernet Connector LEDs

The IMBA-690AM2 has four external USB 2.0 ports. The ports are integrated into two dual USB and LAN combo connectors. The USB ports connect to both USB 2.0 and USB 1.1 devices.

PIN	DESCRIPTION
1	USBVCC
2	DATA-
3	DATA+
4	USBGND

Table 4-36: USB Port Pinouts

4.3.5 Serial Port Connectors (COM1 and COM2)

CN Label: COM1 and COM2

CN Type: DB-9 connectors

CN Location: See Figure 4-27

CN Pinouts: See Table 4-37 and Figure 4-33

Two serial port connectors, COM1 and COM2, are externally accessible. The 9-pin DB-9 serial port connectors are connected to RS-232 serial communications devices.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 4-37: RS-232 Serial Port Pinouts

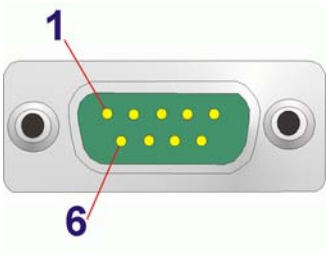


Figure 4-33: Pinout Locations

Chapter

5

Installation

5.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IMBA-690AM2 may result in permanent damage to the IMBA-690AM2 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-690AM2. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-690AM2, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the IMBA-690AM2, place it on an antic-static pad. This reduces the possibility of ESD damaging the IMBA-690AM2.
- ***Only handle the edges of the PCB***:- When handling the PCB, hold the PCB by the edges.

5.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the IMBA-690AM2 is installed. All installation notices pertaining to the installation of the IMBA-690AM2 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the IMBA-690AM2 and injury to the person installing the motherboard.

5.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the IMBA-690AM2, IMBA-690AM2 components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the IMBA-690AM2 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the IMBA-690AM2 on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the IMBA-690AM2 off:

- When working with the IMBA-690AM2, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the IMBA-690AM2 **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

5.2.2 Installation Checklist

The following checklist is provided to ensure the IMBA-690AM2 is properly installed.

- All the items in the packing list are present
- The CPU is installed
- The CPU cooling kit is properly installed
- A compatible memory module is properly inserted into the slot
- The jumpers have been properly configured
- The IMBA-690AM2 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - Primary and secondary IDE device
  - SATA drives
  - Keyboard and mouse cable
  - Audio kit
  - Power supply
  - USB cable
  - Serial port cable
  - Parallel port cable
- The following external peripheral devices are properly connected to the chassis:
  - DVI screen
  - Keyboard

- Mouse
- LAN
- VGA screen

5.3 Unpacking

5.3.1 Unpacking Precautions

When the IMBA-690AM2 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 5.1**.
- Make sure the packing box is facing upwards so the IMBA-690AM2 does not fall out of the box.
- Make sure all the components in the checklist shown in **Chapter 3** are present.

NOTE:

If some of the components listed in the checklist in **Chapter 3** are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IMBA-690AM2 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

5.4 CPU, CPU Cooling Kit and DIMM Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, IMBA-690AM2 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the IMBA-690AM2. If one of these components is not installed the IMBA-690AM2 cannot run.

5.4.1 AMD Socket AM2 CPU Installation

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

To install a socket AM2 CPU onto the IMBA-690AM2, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 2: **Open the CPU socket lever**. Disengage the load lever by moving the lever slightly outward to clear the retention tab. Rotate the load lever to a fully open position. See **Figure 5-1**.

Step 3: **Orientate the CPU properly**. Make sure the IHS (Integrated Heat Sink) side is facing upward. See **Figure 5-1**.

Step 4: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket. See **Figure 5-1**.

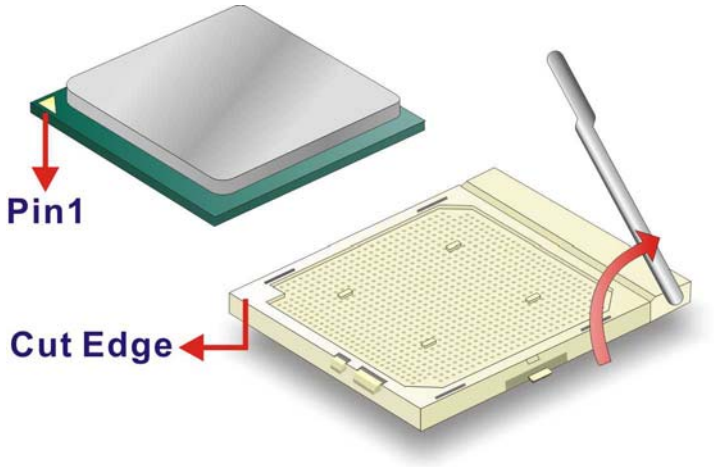


Figure 5-1: Install the CPU

Step 5: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly

Step 6: **Close the CPU socket.** Re-engage the load lever by pushing it back to its original position. Secure the load lever under the retention tab on the side of CPU socket.

5.4.2 Cooling Kit Installation

CF-AM2-RS	**CF-478A**	**CF-519-RS**

Figure 5-2: IEI Cooling Kit for IMBA-690AM2

An IEI AMD Socket AM2 CPU cooling kit (**Figure 5-2**) can be purchased separately. The cooling kit comprises a CPU heat sink and a cooling fan. To install the cooling kit, please follow the steps below.

Step 1: **Spread a proper amount of thermal paste** onto the bottom of the cooling fan heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

Step 2: **Properly orient the cooling kit.** Be sure the cooling kit is properly oriented before installing the cooling kit into the preinstalled cooling kit bracket.

Step 3: **Install the cooling kit into the preinstalled cooling kit bracket.** See **Figure 5-3**.

Step 4: **Attach the levered mounting clips.** Slip the four levered mounting clips into the clip holes on the cooling kit bracket. See **Figure 5-3**.

Step 5: **Secure the cooling kit in place.** Gently push the plastic mounting clip down to lock the cooling kit. See **Figure 5-3**.

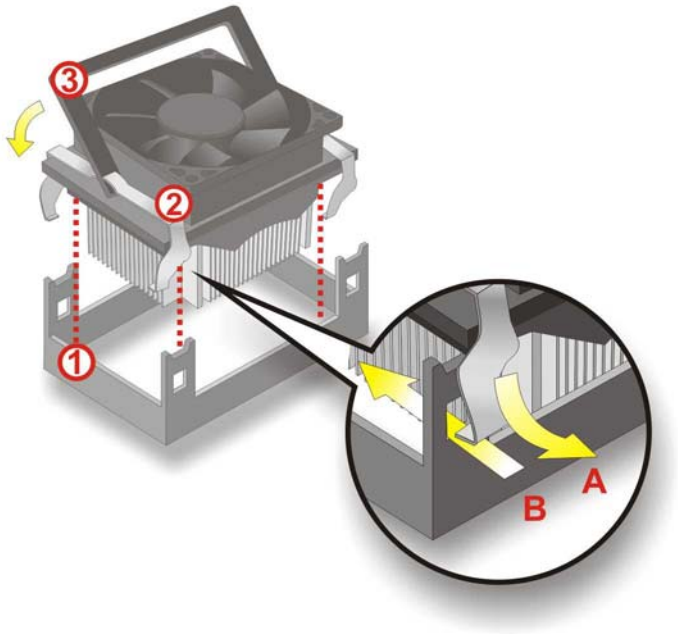


Figure 5-3: Install the CPU cooler

Step 6: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the CPU card. Carefully route the cable and avoid heat generating chips and fan blades.

5.4.3 DIMM Installation

WARNING:

Using incorrectly specified DIMM may cause permanently damage the IMBA-690AM2. Please make sure the purchased DIMM complies with the memory specifications of the IMBA-690AM2. DIMM specifications compliant with the IMBA-690AM2 are listed in **Chapter 2**.

WARNING:

The board supports **DDR2** DIMM modules only. DDR2 and DDR1 are not compatible. If a DDR1 DIMM module is installed, the system may be damaged and become inaccessible. Please only use DDR2 DIMM modules.

To install a DIMM into a DIMM socket, please follow the steps below and refer to **Figure 5-4**.

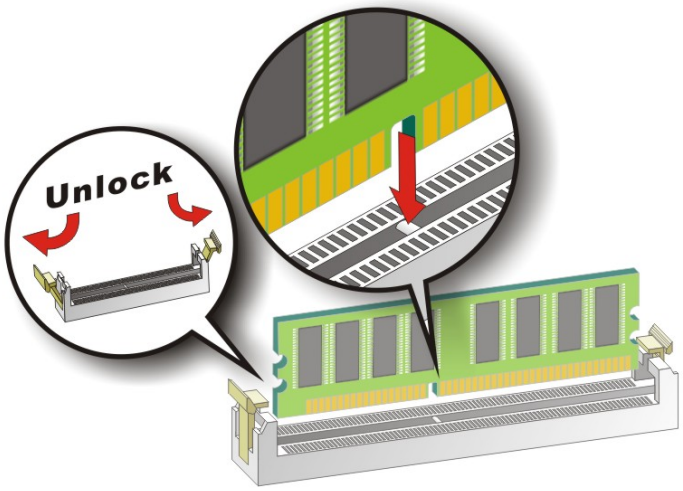


Figure 5-4: Installing a DIMM

Step 1: **Open the DIMM socket handles**. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See **Figure 5-4**.

Step 2: **Align the DIMM with the socket**. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See **Figure 5-4**.

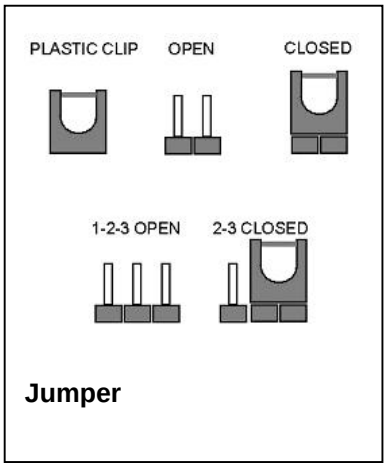
Step 3: **Insert the DIMM**. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 5-4**.

Step 4: **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

5.5 Jumper Settings

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



Jumper

Before the IMBA-690AM2 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the IMBA-690AM2 are listed in **Table 5-1**.

Description	Label	Type
CF card setup	JP4	2-pin header
Clear CMOS	JP1	3-pin header
RS-232/422/485 Setup for COM3	JP2	6-pin header
COM3 voltage setup	JP5	6-pin header

Table 5-1: Jumpers

5.5.1 CF Card Setup

Jumper Label: JP4

Jumper Type: 2-pin header

Jumper Settings: See Table 5-2

Jumper Location: See Figure 5-5

The CF Card Setup jumper sets the CF Type II cards as either the slave device or the master device. CF Card Setup jumper settings are shown in **Table 5-2**.

CF Card Setup	Description	
Open	Slave	Default
Closed	Master	

Table 5-2: CF Card Setup Jumper Settings

The CF Card Setup jumper location is shown in **Figure 5-5**.

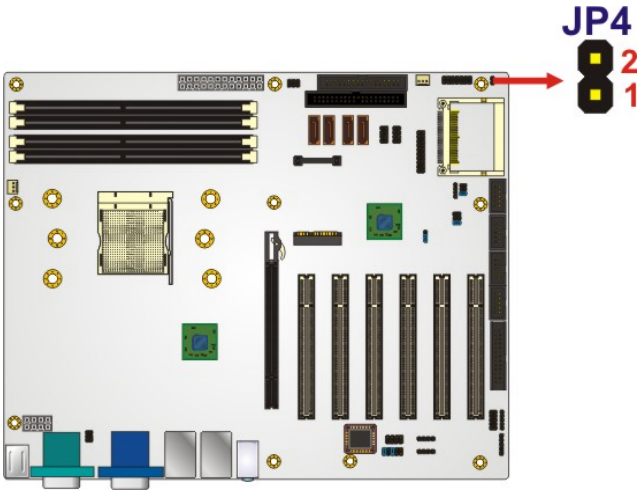


Figure 5-5: CF Card Setup Jumper Location

5.5.2 Clear CMOS Jumper

Jumper Label:	JP1
Jumper Type:	3-pin header
Jumper Settings:	See Table 5-3
Jumper Location:	See Figure 5-6

If the IMBA-690AM2 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting

- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 5-3**.

Jumper Select	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 5-3: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 5-6** below.

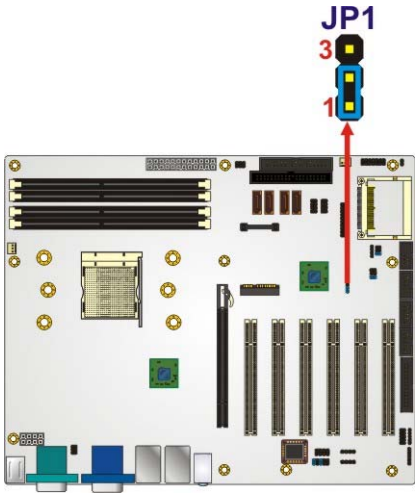


Figure 5-6: Clear CMOS Jumper

5.5.3 COM 3 Function Select Jumper

Jumper Label: JP2

Jumper Type: 6-pin header

Jumper Settings: See Table 5-4

Jumper Location: See Figure 5-7

The COM3 Function Select jumper sets the communication protocol used by the second serial communications port (COM3) as RS-232, RS-422 or RS-485. The COM3 Function Select settings are shown in **Table 5-4**.

COM 3 Function Select	Description	
Short 1-2	RS-232	Default
Short 3-4	RS-422	
Short 5-6	RS-485	

Table 5-4: COM3 Function Select Jumper Settings

The COM3 Function Select jumper location is shown in **Figure 5-7**.

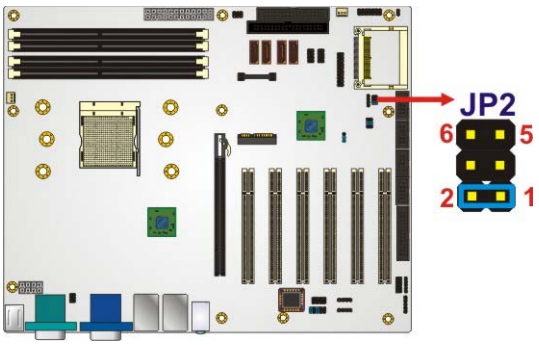


Figure 5-7: COM3 Function Select Jumper Location

5.5.4 COM3 Voltage Setup Jumper

Jumper Label: JP5

Jumper Type: 6-pin header

Jumper Settings: See Table 5-4

Jumper Location: See Figure 5-7

The COM3 Voltage Setup jumper to allow the COM3 voltage to be set. The COM3 Voltage Setup jumper settings are shown in **Table 5-4**.

COM3 Voltage Setup	Description	
Short 1-2	RI	Default

Short 3-4	+5V	
Short 5-6	+12V	

Table 5-5: COM3 Voltage Setup Jumper Settings

The COM3 Voltage Setup jumper location is shown in **Figure 5-7**.

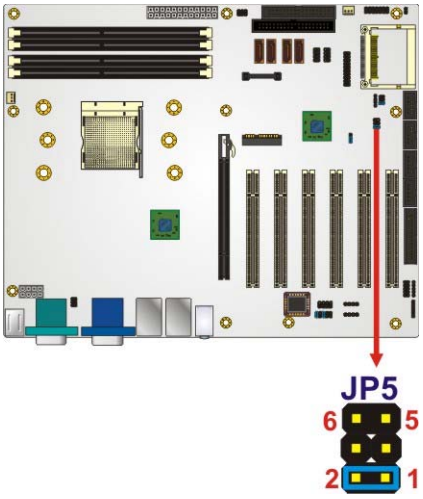


Figure 5-8: COM3 Voltage Setup Jumper Location

5.6 Chassis Installation

5.6.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the IMBA-690AM2 must have air vents to allow cool air to move into the system and hot air to move out.

The IMBA-690AM2 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

5.6.2 Motherboard Installation

To install the IMBA-690AM2 motherboard into the chassis please refer to the reference material that came with the chassis.

5.7 Internal Peripheral Device Connections

5.7.1 Peripheral Device Cables

The cables listed in **Table 5-6** are shipped with the IMBA-690AM2.

Quantity	Type
1	ATA 66/100 flat cable
1	Dual RS-232 cable
2	SATA drive cables
1	SATA drive power cables

Table 5-6: IEI Provided Cables

Separately purchased optional IEI items that can be installed are listed below:

- USB cables
- FDD cable
- Parallel port cable

For more details about the items listed above, please refer to **Chapter 3**. Installation of the accessories listed above are described in detail below.

5.7.2 ATA Flat Cable Connection

The ATA 66/100 flat cable connects to the IMBA-690AM2 to one or two IDE devices. To connect an IDE HDD to the IMBA-690AM2 please follow the instructions below.

Step 1: **Locate the IDE connector**. The location/s of the IDE device connector/s is/are shown in **Chapter 3**.

Step 2: **Insert the connector**. Connect the IDE cable connector to the onboard connector. See **Figure 5-9**. A key on the front of the cable connector ensures it can only be inserted in one direction.

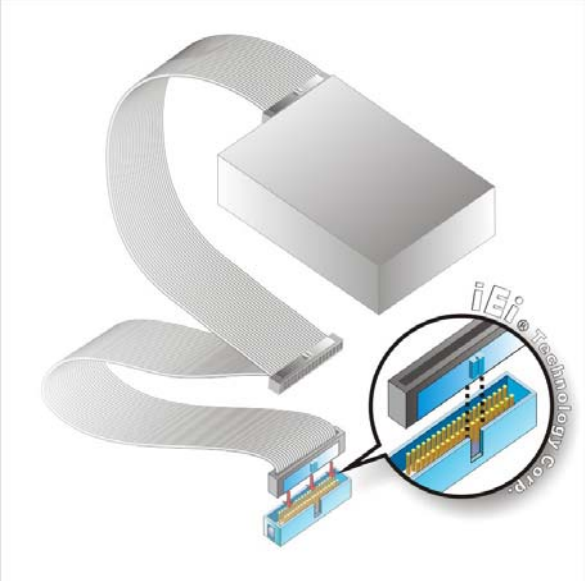


Figure 5-9: IDE Cable Connection

Step 3: **Connect the cable to an IDE device**. Connect the two connectors on the other side of the cable to one or two IDE devices. Make sure that pin 1 on the cable corresponds to pin 1 on the connector.

5.7.3 Dual RS-232 Cable Connection

The dual RS-232 cable consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a bracket. To install the dual RS-232 cable, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the RS-232 connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connectors**. Insert one connector into each serial port box headers. See **Figure 5-10**. A key on the front of the cable connectors ensures

the connector can only be installed in one direction.

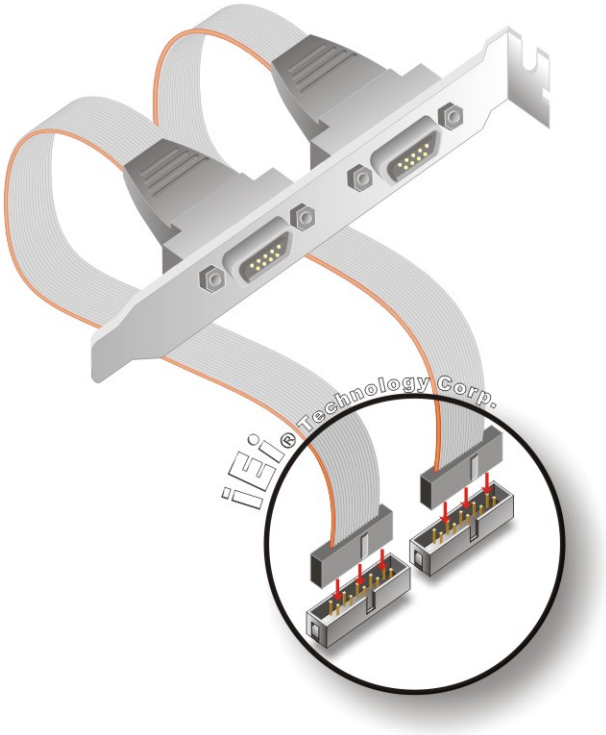


Figure 5-10: Dual RS-232 Cable Installation

Step 3: **Secure the bracket**. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis.

5.7.4 SATA Drive Connection

The IMBA-690AM2 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 5-11**.

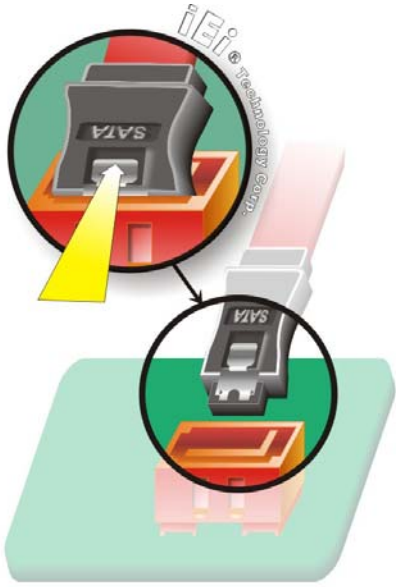


Figure 5-11: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 5-12**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-12**.

Figure 5-12: SATA Power Drive Connection

5.7.5 FDD Cable Connection

The FDD flat cable connects to the IMBA-690AM2 to one FDD device. To connect an FDD to the IMBA-690AM2 please follow the instructions below.

Step 1: **Locate the FDD connector**. The location of the FDD device connector is shown in **Chapter 3**.

Step 2: **Insert the connector**. Connect the FDD cable connector to the on-board connector. See **Figure 5-13**. A key on the front of the cable connector ensures it can only be inserted in one direction.

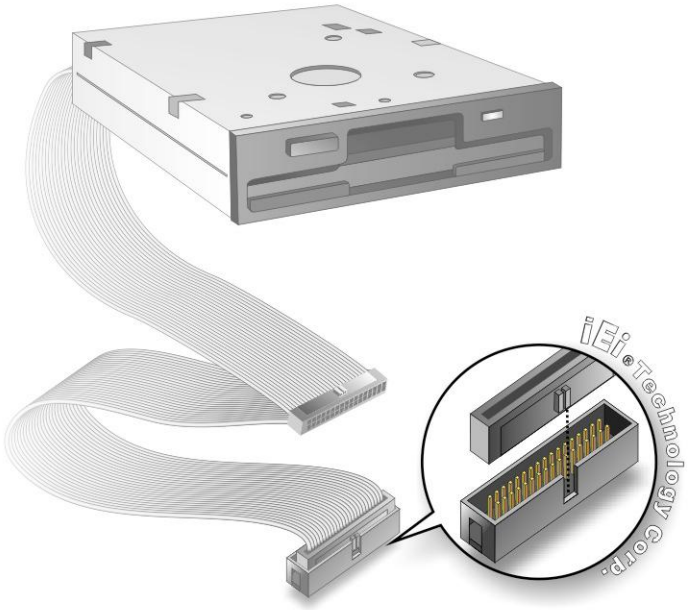


Figure 5-13: FDD Cable Connection

Step 3: **Connect the cable to an FDD device**. Connect the connector at the other end of the cable to an FDD device. Make sure that pin 1 on the cable corresponds to pin 1 on the connector.

5.7.6 Parallel Port Cable with Slot Bracket

The optional parallel port (LPT) cable respectively connects the onboard LPT 26-pin box header to an external LPT device (like a printer). The cable comprises a 26-pin female header, to be connected to the onboard LPT box-header, on one side and on the other side a standard external LPT connector. To connect the LPT cable, please follow the steps below.

Step 1: **Locate the connector**. The LPT connector location is shown in **Chapter 4**.

Step 2: **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on the IMBA-690AM2 LPT box-header connector. See **Figure 5-14**.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the 26-pin box-header connector on the IMBA-690AM2, connect the cable connector to the onboard connector. See **Figure 5-14.**

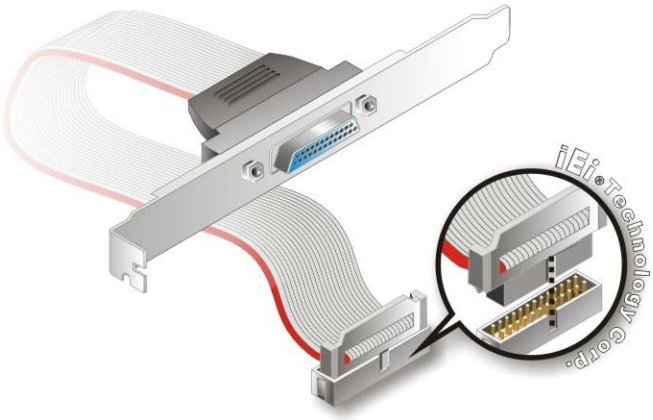


Figure 5-14: LPT Cable Connection

Step 4: **Attach the LPT connector bracket to the chassis**. The LPT cable connector is connected to a standard external LPT interface connector. To secure the LPT interface connector to the chassis please refer to the installation instructions that came with the chassis.

Step 5: **Connect LPT device**. Once the LPT interface connector is connected to the chassis, the LPT device can be connected to the LPT interface connector. See **Figure 5-15**

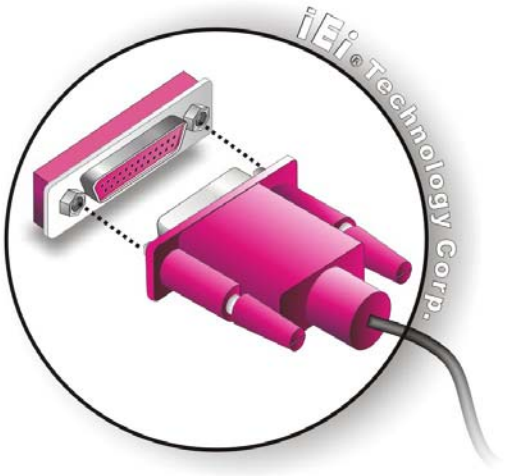


Figure 5-15: Connect the LPT Device

5.7.7 USB Cable (Four Port)

Four port USB 2.0 cables can be separately purchased from IEI. To install a four port USB cable onto the IMBA-690AM2, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 4**.

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. Each cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the IMBA-690AM2 USB connectors.

Step 3: **Insert the cable connectors**. Once the cable connectors are properly aligned

with the USB connectors on the IMBA-690AM2, connect the cable connectors to the onboard connectors. See **Figure 5-16**.

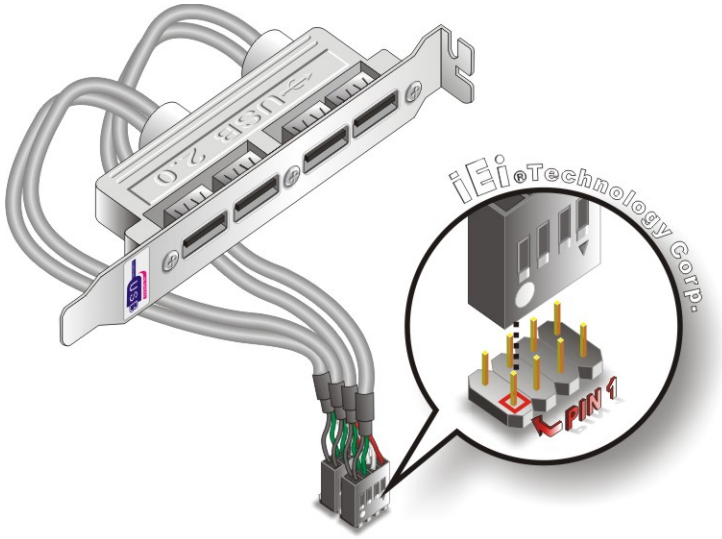


Figure 5-16: Four Port USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

5.8 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Audio jacks
- DVI display
- PS/2 keyboard and mouse
- RJ-45 Ethernet cable connectors
- Serial ports
- USB ports
- VGA screen

To install these devices, connect the corresponding cable connector from the actual device to the corresponding IMBA-690AM2 external peripheral interface connector making sure the pins are properly aligned.

5.8.1 Audio Connection

Audio signals are interfaced through three phone jack connections. The red phone jack is for Mic In, blue is for Line In and green is for Speaker Out. Follow the steps below to connect audio devices to the IMBA-690AM2.

Step 1: **Locate the audio phone jacks**. The location of the audio phone jacks are shown in **Chapter 3**.

Step 2: **Insert audio phone jack plugs**. Insert audio phone jack plugs into the audio phone jacks on the external peripheral interface. See Figure 5-17.

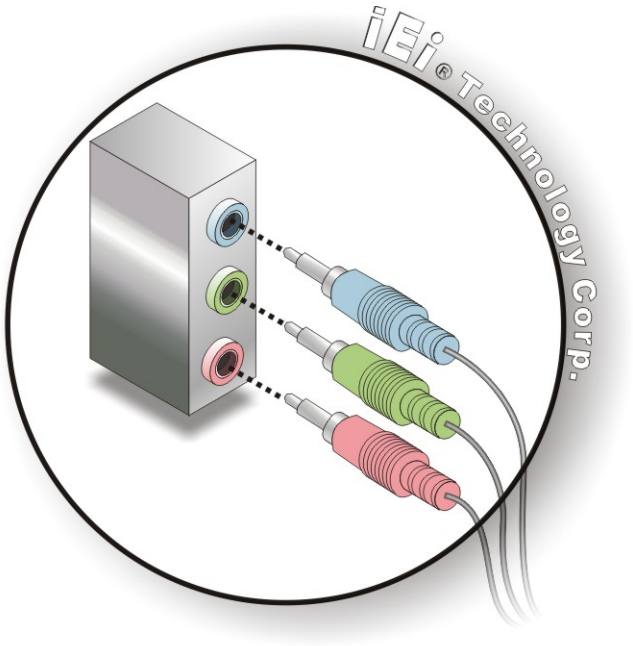


Figure 5-17: Audio Connectors

5.8.2 DVI Display Device Connection

The IMBA-690AM2 has a single female DVI connector on the external peripheral interface panel. The DVI connector is connected to a digital display device. To connect a digital display device to the IMBA-690AM2, please follow the instructions below.

Step 1: **Locate the DVI connector**. The location of the DVI connector is shown in **Chapter 2**.

Step 2: **Align the DVI connector**. Align the male DVI connector on the digital display device cable with the female DVI connector on the external peripheral interface.

Step 3: **Insert the DVI connector** Once the connectors are properly aligned with the male connector, insert the male connector from the digital display device into the female connector on the IMBA-690AM2. See **Figure 5-18**.

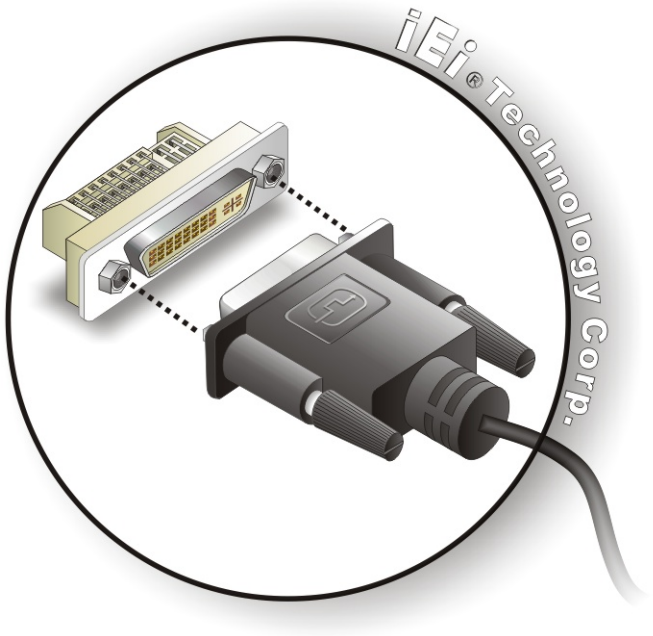


Figure 5-18: DVI Connector

Step 4: **Secure the connector.** Secure the DVI connector from the digital display device to the external interface by tightening the two retention screws on either side of the connector.

5.8.3 LAN Connection (Single Connector)

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The locations of the USB connectors are shown in **Chapter 4**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the IMBA-690AM2. See **Figure 5-19**.

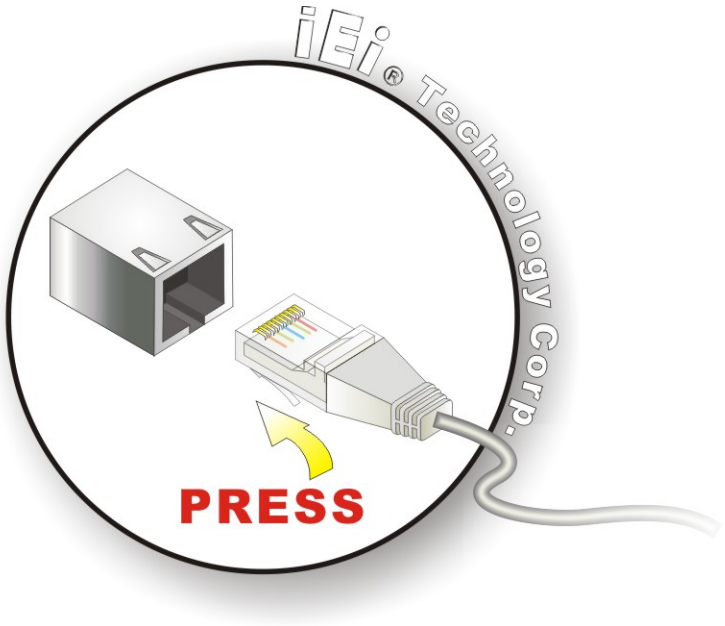


Figure 5-19: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

5.8.4 PS/2 Keyboard and Mouse Connection

The IMBA-690AM2 has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the IMBA-690AM2.

Step 1: **Locate the dual PS/2 connector**. The location of the dual PS/2 connector is shown in **Chapter 3**.

Step 2: **Insert the keyboard/mouse connector**. Insert a PS/2 keyboard or mouse connector into the appropriate PS/2 connector on the external peripheral interface connector. See Figure 5-20.

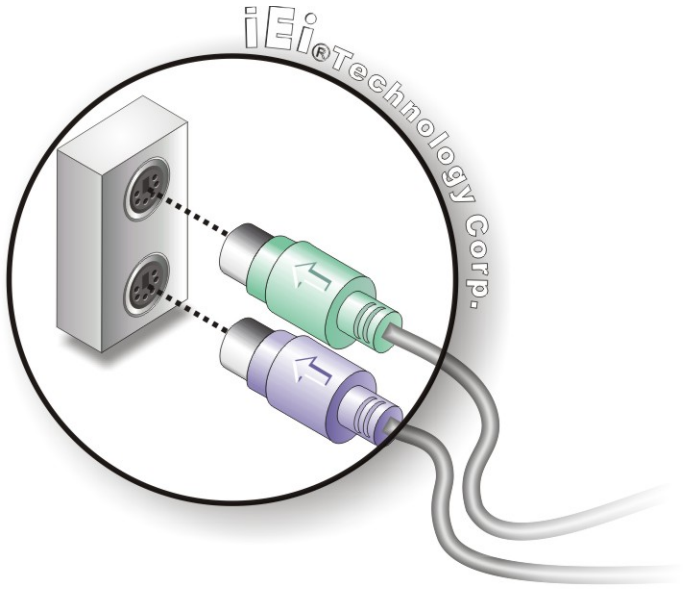


Figure 5-20: PS/2 Keyboard/Mouse Connector

5.8.5 Serial Device Connection

The IMBA-690AM2 has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the IMBA-690AM2.

Step 1: **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Chapter 3**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 5-21.

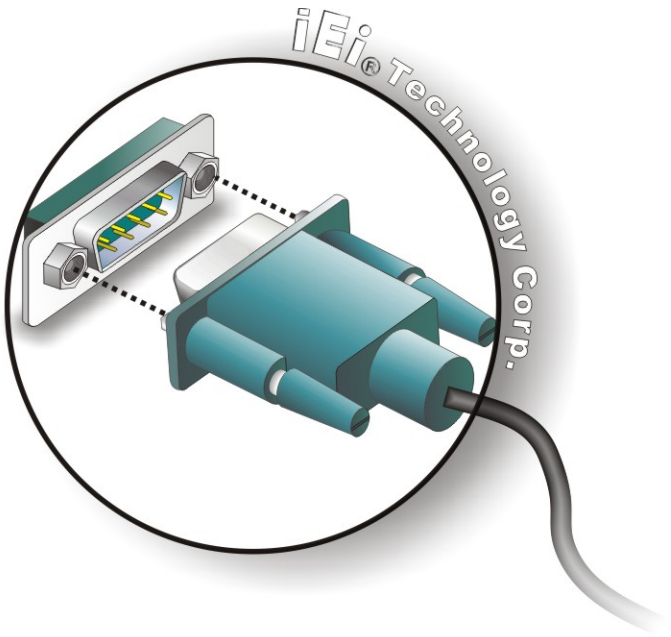


Figure 5-21: Serial Device Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

5.8.6 USB Connection (Dual Connector)

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the IMBA-690AM2.

Step 1: **Locate the USB Series "A" receptacle connectors**. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See Figure 5-22.

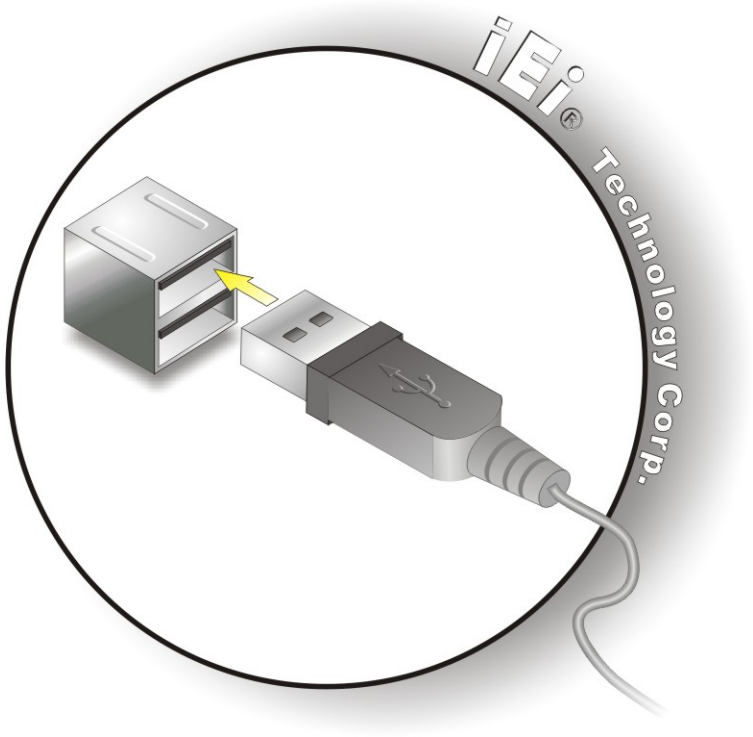


Figure 5-22: USB Connector

5.8.7 VGA Monitor Connection

The IMBA-690AM2 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the IMBA-690AM2, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the IMBA-690AM2. See **Figure 5-23**.

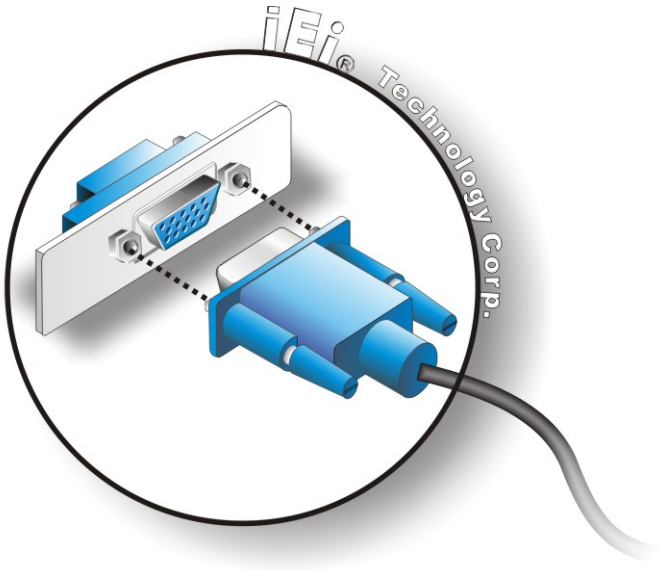


Figure 5-23: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

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Chapter

6

BIOS Screens

6.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

6.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

6.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 6-1: BIOS Navigation Keys

6.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

6.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Chapter 5**.

6.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

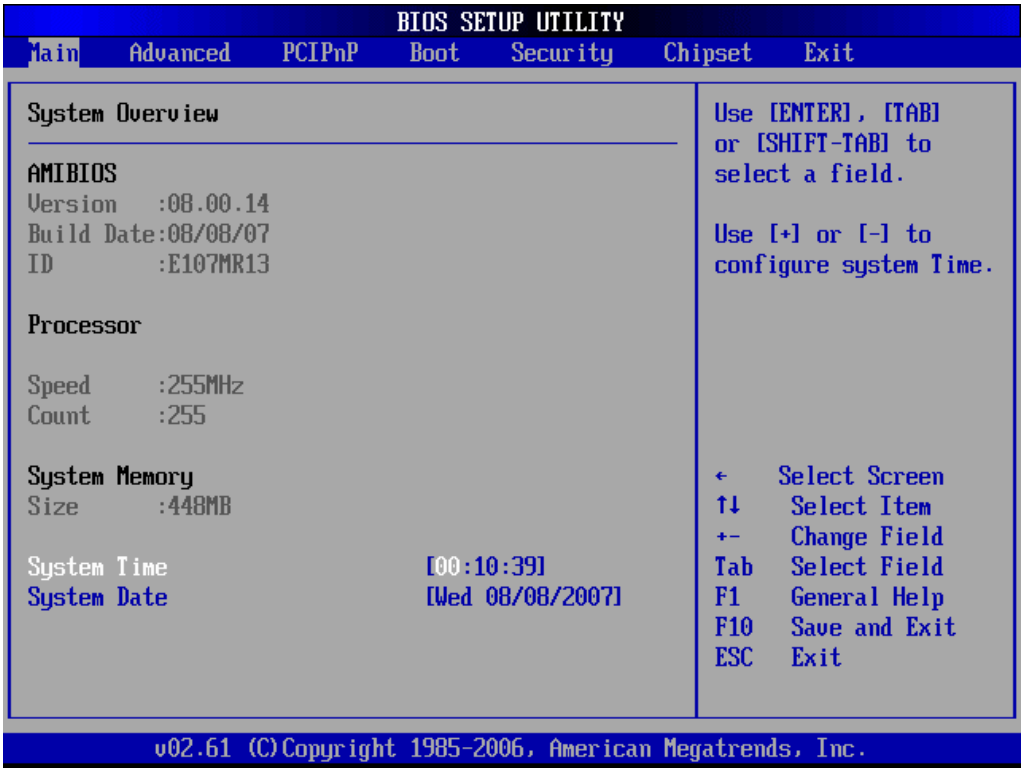
- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Power** Changes power management settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

6.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications
  - **Type**: Names the currently installed processor
  - **Speed**: Lists the processor speed

- **Count**: The number of CPUs on the motherboard

- **System Memory**: Displays the auto-detected system memory.
  - **Size**: Lists memory size

The **System Overview** field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

6.3 Advanced

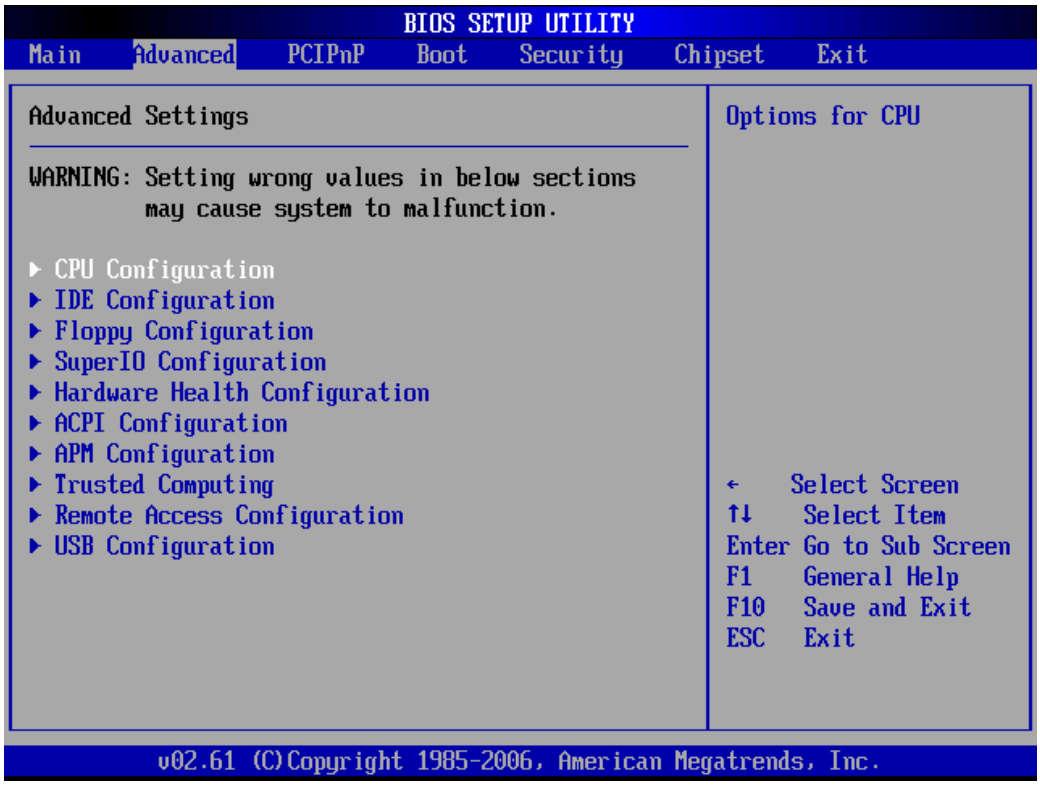
Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

- **CPU Configuration** (see **Section 6.3.1**)
- **IDE Configuration** (see **Section 6.3.2**)
- **Floppy Configuration** (see **Section 6.3.3**)
- **SuperIO Configuration** (see **Section 6.3.4**)
- **Hardware Health Configuration** (see **Section 6.3.5**)
- **ACPI Configuration** (see **Section 6.3.6**)
- **APM Configuration** (see **Section 6.3.7**)
- **Trusted Computing** (see **Section 6.3.8**)

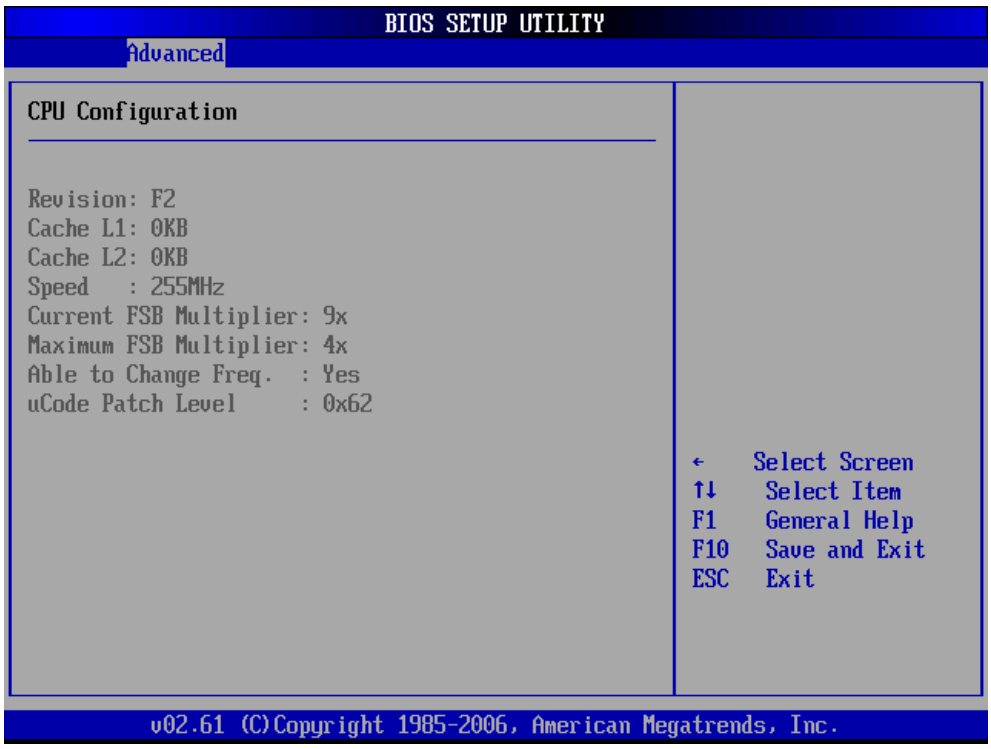
- **Remote Access Configuration** (see **Section 6.3.9**)
- **USB Configuration** (see **Section 6.3.10**)



BIOS Menu 2: Advanced

6.3.1 CPU Configuration

Use the CPU Configuration menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.



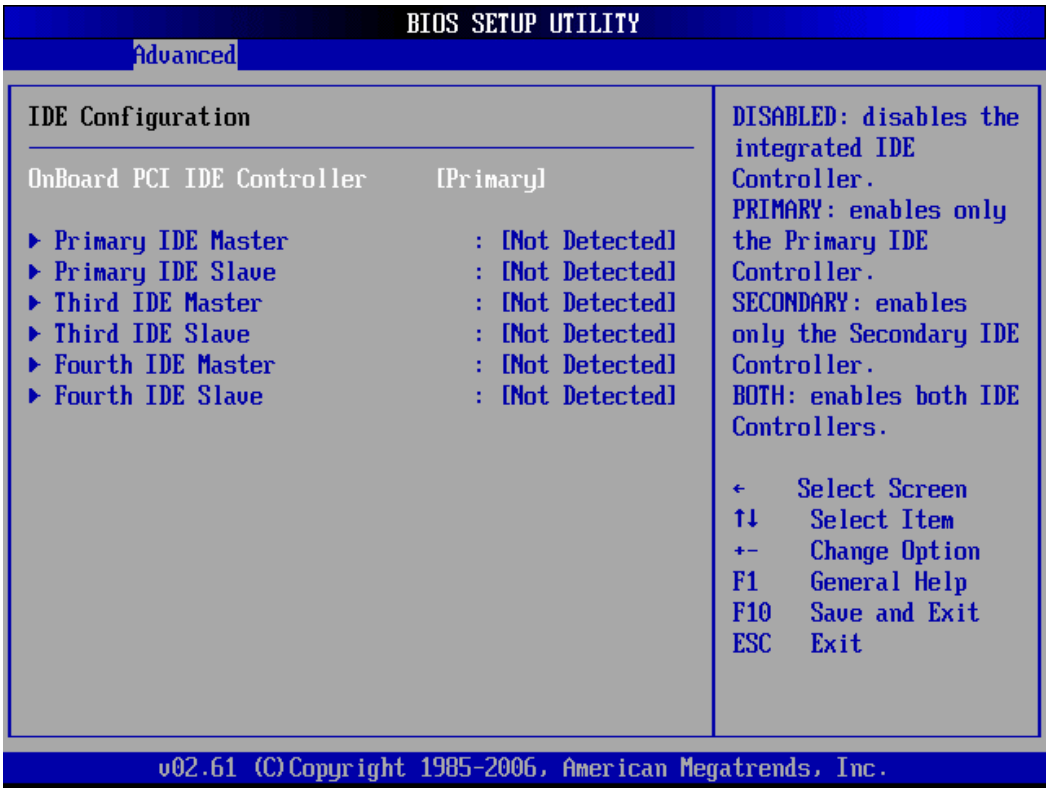
BIOS Menu 3: CPU Configuration

The CPU Configuration menu (BIOS Menu 3) lists the following CPU details:

- **Revision**: Lists the CPU revision number
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size
- **Speed:** Lists the CPU processing speed
- **Current FSB Multiplier**: Specifies how much the FSB is increased by
- **Maximum FSB Multiplier**: Specifies the maximum the FSB can be increased
- **Able to Change Freq**: Specifies the CPU frequency cannot be changed.
- **uCode Patch Level**

6.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.


BIOS SETUP UTILITY
Advanced
IDE Configuration
OnBoard PCI IDE Controller [Primary]
Primary IDE Master : [Not Detected]
Primary IDE Slave : [Not Detected]
Third IDE Master : [Not Detected]
Third IDE Slave : [Not Detected]
Fourth IDE Master : [Not Detected]
Fourth IDE Slave : [Not Detected]
DISABLED: disables the integrated IDE Controller.
PRIMARY: enables only the Primary IDE Controller.
SECONDARY: enables only the Secondary IDE Controller.
BOTH: enables both IDE Controllers.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 4: IDE Configuration

➔ **OnBoard PCI IDE Controller [Primary]**

The **OnBoard PCI IDE Controller** BIOS option specifies the IDE channels used by the onboard PCI IDE controller. The following configuration options are available.

➔ **Disabled** Prevents the system from using the onboard IDE controller

➔ **Primary** **DEFAULT** Only allows the system to detect the Primary IDE channel, including both the Primary Master and Primary

Slave)

➔ **IDE Master and IDE Slave**

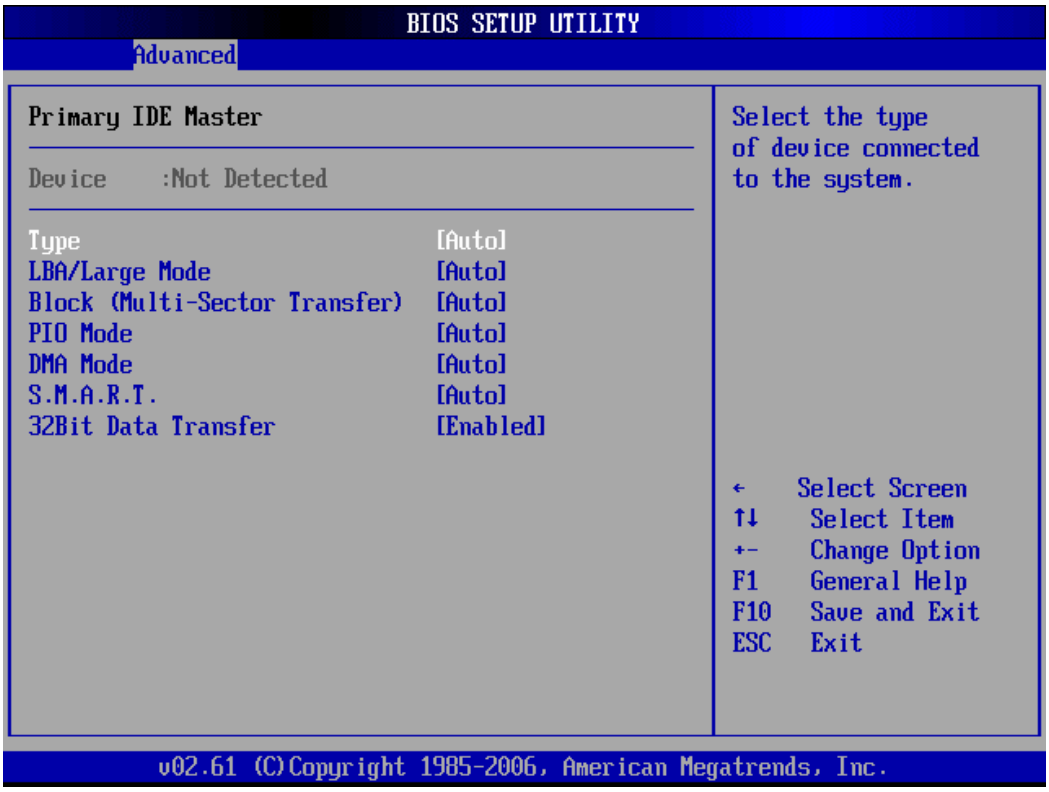
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 6.3.2.1** appear.

6.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type**: Indicates the type of devices a user can manually select
- **Vendor**: Lists the device manufacturer
- **Size**: List the storage capacity of the device.
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.

- **PIO Mode**: Indicates the PIO mode of the installed device.
- **Async DMA**: Indicates the highest Asynchronous DMA Mode that is supported.
- **Ultra DMA**: Indicates the highest Synchronous DMA Mode that is supported.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- **32Bit Data Transfer**: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed**		BIOS is prevented from searching for an IDE disk drive on the specified channel.
➔ **Auto**	**DEFAULT**	The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
➔ **CD/DVD**		The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
➔ **ARMD**		This option specifies an ATAPI Removable Media Device. These include, but are not limited to: ➔ **ZIP** ➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled**		BIOS is prevented from using the LBA mode control on the specified channel.
➔ **Auto**	**DEFAULT**	BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled**		BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
➔ **Auto**	**DEFAULT**	BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto**	**DEFAULT**	BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

- **0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps
- **1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps
- **2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps
- **3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps
- **4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps

  (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

- **Auto** **DEFAULT** BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
- **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps
- **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps
- **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps
- **MWDMA0** Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2MBps
- **MWDMA1** Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3MBps
- **MWDMA2** Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6MBps

➔ **UDMA1**	Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps
➔ **UDMA1**	Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps
➔ **UDMA2**	Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps
➔ **UDMA3**	Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
➔ **UDMA4**	Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
➔ **UDMA5**	Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto**	**DEFAULT**	BIOS auto detects HDD SMART support.
➔ **Disabled**		Prevents BIOS from using the HDD SMART feature.
➔ **Enabled**		Allows BIOS to use the HDD SMART feature

➔ **32Bit Data Transfer [Enabled]**

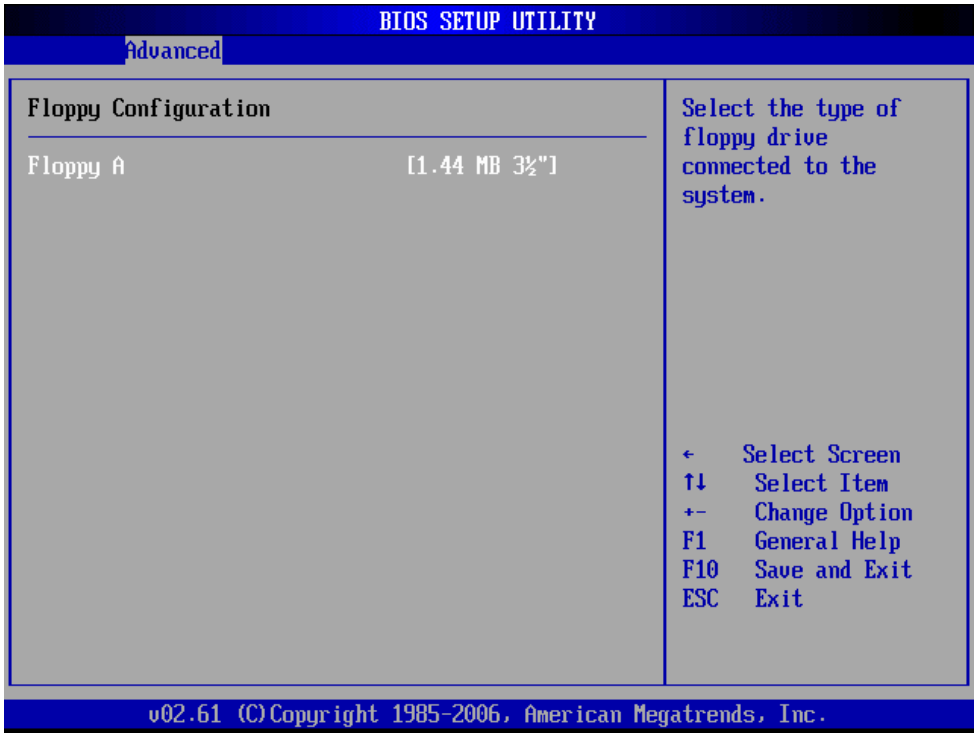
Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.

➔ **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

6.3.3 Floppy Configuration

Use the **Floppy Configuration menu** to configure the floppy disk drive connected to the system.



BIOS Menu 6: IDE Master and IDE Slave Configuration

➔ **Floppy A/B**

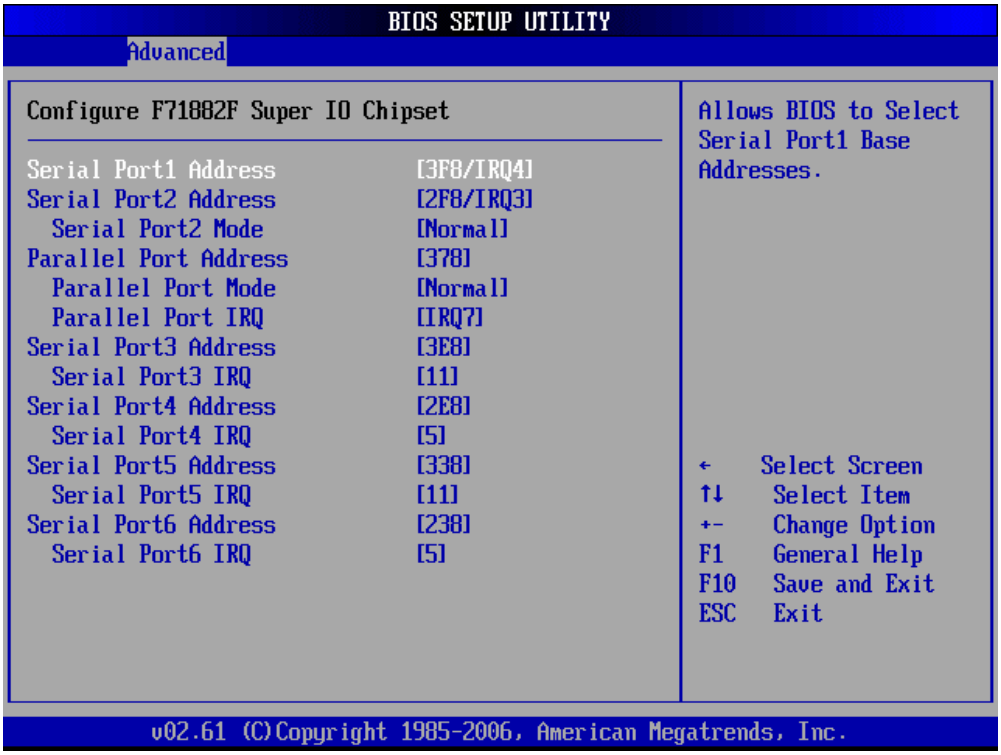
Use the **Floppy A/B** option to configure the floppy disk drive. Options are listed below:

- Disabled
- 360 KB 51/4”
- 1.2 MB 51/4”

- 720 KB 31/2”
- 1.44 MB 31/2’ **DEFAULT**
- 2.88 MB 31/2”

6.3.4 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 7**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 7: Super IO Configuration

➔ **Serial Port1 Address [3F8/IRQ4]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled** No base address is assigned to Serial Port 1

➔ **3F8/IRQ4** **DEFAULT** Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4

➔ **3E8/IRQ4** Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4

➔ **2E8/IRQ3** Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Address [2F8/IRQ3]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

➔ **Disabled** No base address is assigned to Serial Port 2

➔ **2F8/IRQ3** **DEFAULT** Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3

➔ **3E8/IRQ4** Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4

➔ **2E8/IRQ3** Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Mode [Normal]**

Use the **Serial Port2 Mode** option to select the Serial Port2 operational mode.

➔ **Normal** **DEFAULT** Serial Port 2 mode is normal

➔ **IrDA** Serial Port 2 mode is IrDA

➔ **ASK IR** Serial Port 2 mode is ASK IR

➔ **Parallel Port Address [378]**

Use the **Parallel Port Address** option to select the parallel port base address.

➔ **Disabled** No base address is assigned to the Parallel Port

➔ **378**	**DEFAULT**	Parallel Port I/O port address is 378
➔ **278**		Parallel Port I/O port address is 278
➔ **3BC**		Parallel Port I/O port address is 3BC

➔ **Parallel Port Mode [Normal]**

Use the **Parallel Port Mode** option to select the mode the parallel port operates in.

➔ **Normal**	**DEFAULT**	The normal parallel port mode is the standard mode for parallel port operation.
➔ **Bi-directional**		Parallel port outputs are 8-bits long. Inputs are accomplished by reading 4 of the 8 bits on the status register.
➔ **EPP**		The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.
➔ **ECP+EPP**		The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode The parallel port is also be compatible with EPP devices described above

➔ **Parallel Port IRQ [IRQ7]**

Use the **Parallel Port IRQ** selection to set the parallel port interrupt address.

- ➔ **IRQ5** IRQ5 is assigned as the parallel port interrupt address
- ➔ **IRQ7** **DEFAULT** IRQ7 is assigned as the parallel port interrupt address

➔ **Serial Port3 Address [3E8]**

Use the **Serial Port3 Address** option to select the base addresses for serial port 3

- ➔ **Disabled** No base address is assigned to serial port 3
- ➔ **3E8** **DEFAULT** Serial port 3 I/O port address is 3E8
- ➔ **2E8** Serial port 3 I/O port address is 2E8
- ➔ **338** Serial port 3 I/O port address is 338
- ➔ **238** Serial port 3 I/O port address is 238

➔ **Serial Port3 IRQ [11]**

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 3.

- ➔ **5** Serial port 3 IRQ address is 5
- ➔ **11** **DEFAULT** Serial port 3 IRQ address is 11

➔ **Serial Port4 Address [2E8]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- ➔ **Disabled** No base address is assigned to serial port 3
- ➔ **3E8** Serial port 4 I/O port address is 3E8
- ➔ **2E8** **DEFAULT** Serial port 4 I/O port address is 2E8

- ➔ **338** Serial port 3 I/O port address is 338
- ➔ **238** Serial port 3 I/O port address is 238

➔ **Serial Port4 IRQ [5]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- ➔ **5** **DEFAULT** Serial port 4 IRQ address is 5
- ➔ **11** Serial port 4 IRQ address is 11

➔ **Serial Port5 Address [338]**

Use the **Serial Port5 IRQ** option to select the interrupt address for serial port 5.

- ➔ **Disabled** No base address is assigned to serial port 5
- ➔ **3E8** Serial port 5 I/O port address is 3E8
- ➔ **2E8** Serial port 5 I/O port address is 2E8
- ➔ **338** **DEFAULT** Serial port 5 I/O port address is 338
- ➔ **238** Serial port 5 I/O port address is 238

➔ **Serial Port5 IRQ [11]**

Use the **Serial Port5 IRQ** option to select the interrupt address for serial port 5.

- ➔ **5** Serial port 5 IRQ address is 5
- ➔ **11** **DEFAULT** Serial port 5 IRQ address is 11

➔ **Serial Port6 Address [238]**

Use the **Serial Port6 IRQ** option to select the interrupt address for serial port 6.

- ➔ **Disabled** No base address is assigned to serial port 6

➔ **3E8** Serial port 6 I/O port address is 3E8

➔ **2E8** Serial port 6 I/O port address is 2E8

➔ **338** Serial port 6I/O port address is 338

➔ **238** **DEFAULT** Serial port 6 I/O port address is 238

➔ **Serial Port6 IRQ [5]**

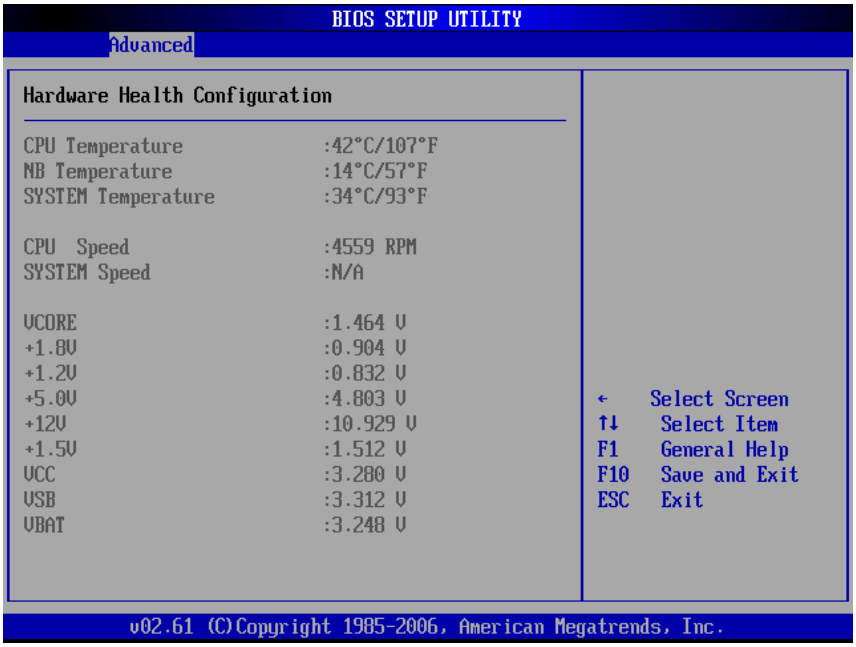
Use the **Serial Port6 IRQ** option to select the interrupt address for serial port 6.

➔ **5** **DEFAULT** Serial port 6 IRQ address is 5

➔ **11** Serial port 6 IRQ address is 11

6.3.5 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 8**) shows the operating temperature, fan speeds and system voltages.



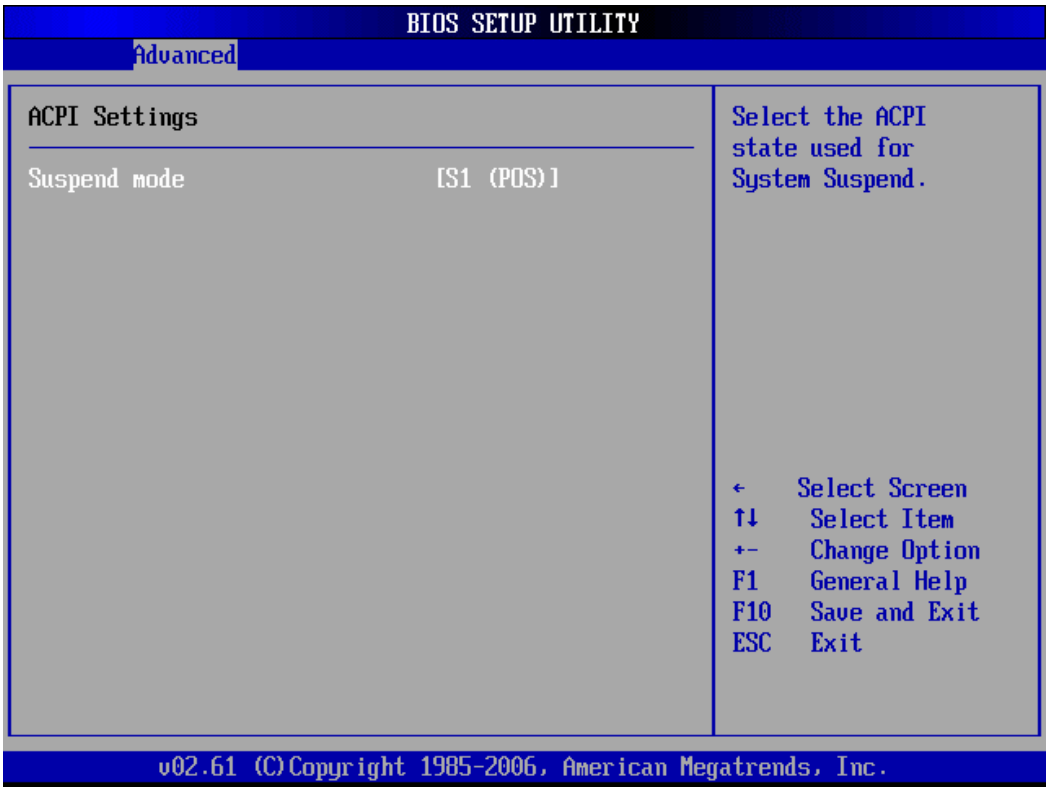
BIOS Menu 8: Hardware Health Configuration

The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures**: The following system temperatures are monitored
  - CPU Temperature
  - System Temperature
- **Fan Speeds**: The CPU cooling fan speed is monitored.
  - CPU Fan Speed
  - System Fan Speed
- **Voltages**: The following system voltages are monitored
  - VCore
  - +1.8V
  - +1.2V
  - +5.0V
  - +12V
  - +1.5V
  - VCC
  - VSB
  - VBAT

6.3.6 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 9**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



BIOS Menu 9: ACPI Configuration

➔ **Suspend Mode [S1 (POS)]**

The **Suspend Mode** BIOS option specifies the sleep state your system will enter when it is not being used.

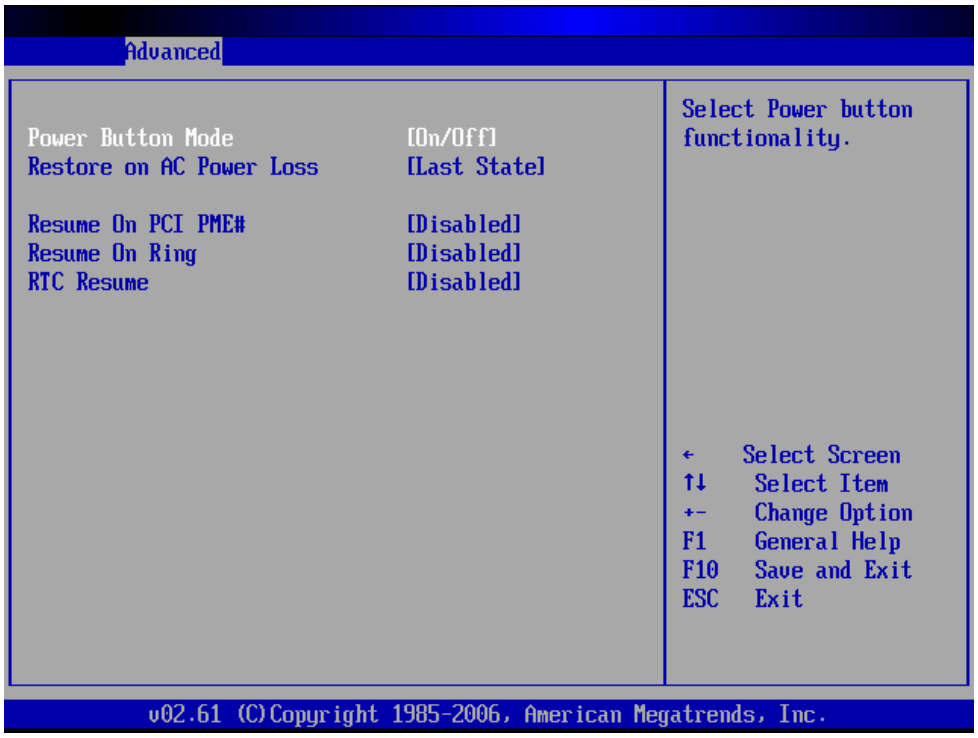
➔ **S1 (POS)** **DEFAULT** System appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (STR)** System appears off. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

➔ **Auto** The system automatically determines the system sleep state.

6.3.7 APM Configuration

The **APM Configuration** menu (**BIOS Menu 10**) allows the advanced power management options to be configured.



BIOS Menu 10:Advanced Power Management Configuration

➔ **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

➔ **On/Off** **DEFAULT** When the power button is pressed the system is either turned on or off

➔ **Suspend** When the power button is pressed the system goes into suspend mode

➔ **Restore on AC Power Loss [Last State]**

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off**		The system remains turned off
➔ **Power On**		The system turns on
➔ **Last State**	**DEFAULT**	The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Resume on PCI PME# [Disabled]**

The **Resume on PCI PME#** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the PCI PME (power management event) controller.

➔ **Disabled**	**DEFAULT**	Wake event not generated by PCI PME controller activity
➔ **Enabled**		Wake event generated by PCI PME controller activity

➔ **Resume on Ring [Disabled]**

The **Resume on Ring** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the RI (ring in) modem line. That is, the system will be roused by an incoming call on a modem.

➔ **Disabled**	**DEFAULT**	Wake event not generated by an incoming call
➔ **Enabled**		Wake event generated by an incoming call

➔ **RTC Resume [Disabled]**

Use the **RTC Resume** option to specify the time the system should be roused from a suspended state.

➔ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

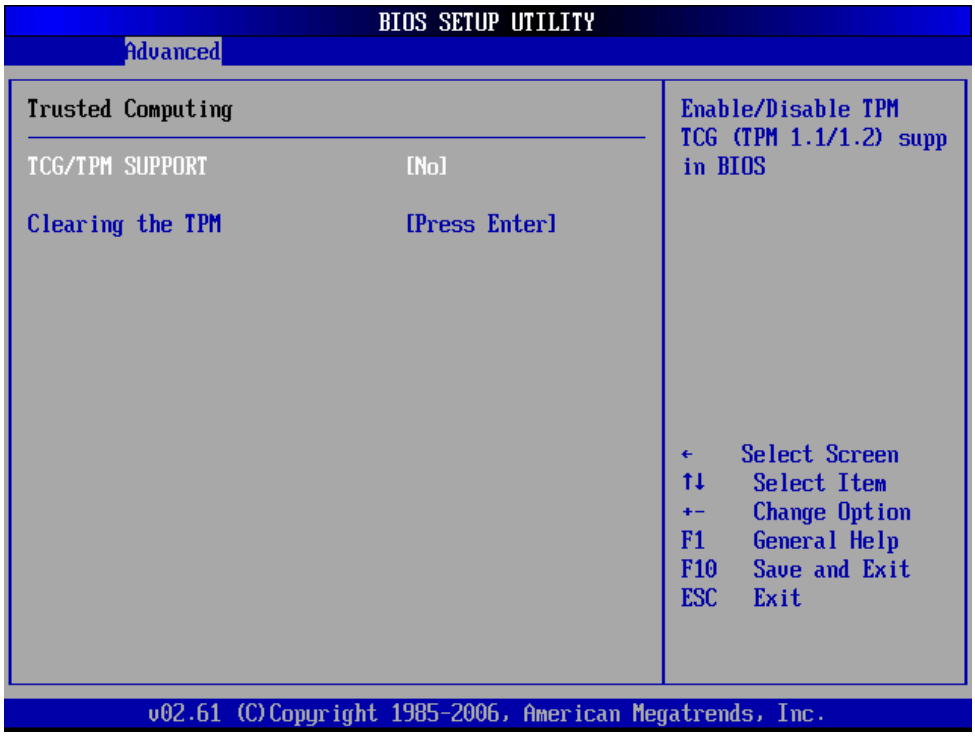
➔ **Enabled** If selected, the following appears with values that can be selected:

- ➔ **RTC Alarm Date (Days)**
- ➔ **System Time**

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

6.3.8 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 11**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 11: Trusted Computing

➔ **TCG/TPM Support [No]**

Use the **TCG/TPM Support** option to configure support for the TPM.

➔ **No** **DEFAULT** TPM support is disabled.

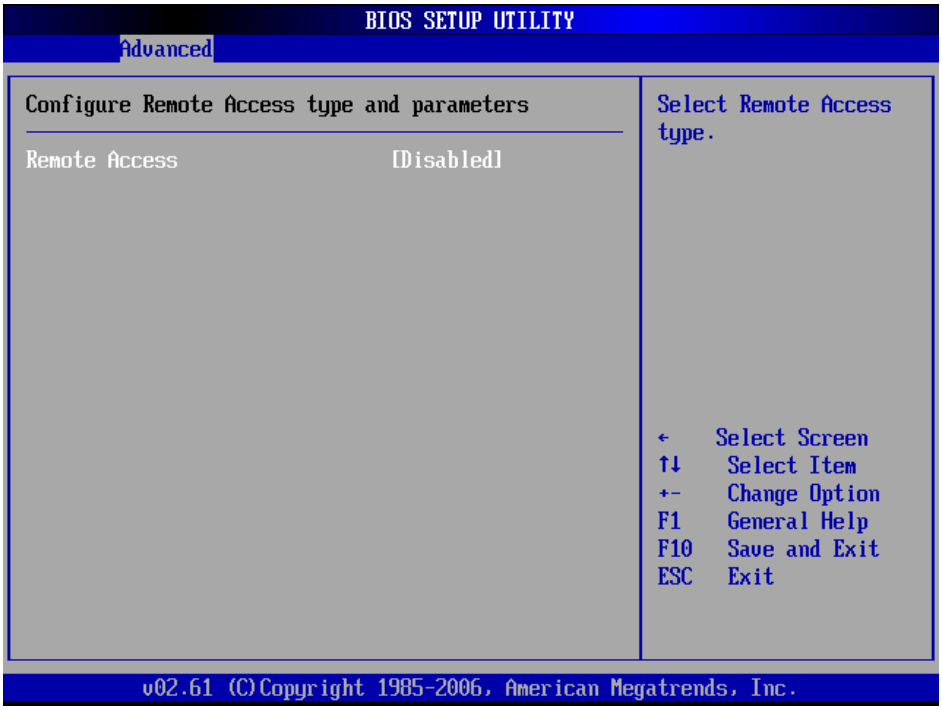
➔ **Yes** TPM support is enabled.

➔ **Clearing the TPM [Press Enter]**

Use the **Clearing the TPM** option to clear the information stored in the TPM.

6.3.9 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 12**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 12: Remote Access Configuration [Advanced]

➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled**	**DEFAULT**	Remote access is disabled.
➔ **Enabled**		Remote access configuration options shown below appear:

- ➔ **Serial Port Number**
- ➔ **Serial Port Mode**
- ➔ **Flow Control**
- ➔ **Redirection after BIOS POST**
- ➔ **Terminal Type**
- ➔ **VT-UTF8 Combo Key Support**
- ➔ **Sredir Memory Display Delay**

These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

Use the **Serial Port Number** option allows to select the serial port used for remote access.

➔ **COM1**	**DEFAULT**	System is remotely accessed through COM1
➔ **COM2**		System is remotely accessed through COM2
➔ **COM3**		System is remotely accessed through COM3
➔ **COM4**		System is remotely accessed through COM4

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ **Base Address, IRQ [3F8h,4]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

➔ **Flow Control [None]**

Use the **Flow Control** option to report the flow control method for the console redirection application.

➔	**None**	**DEFAULT**	No control flow,
➔	**Hardware**		Hardware is set as the console redirection
➔	**Software**		Software is set as the console redirection

➔ **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

➔ **Disabled**		The console is not redirected after POST
➔ **Boot Loader**		Redirection is active during POST and during Boot Loader
➔ **Always**	**DEFAULT**	Redirection is always active (Some OSes may not work if set to Always)

➔ **Terminal Type [ANSI]**

Use the **Terminal Type** BIOS option to specify the remote terminal type.

➔ **ANSI**	**DEFAULT**	The target terminal type is ANSI
➔ **VT100**		The target terminal type is VT100
➔ **VT-UTF8**		The target terminal type is VT-UTF8

➔ **VT-UTF8 Combo Key Support [Enabled]**

Use the **VT-UFT8 Combo Key Support** option to enable additional keys that are not provided by VT100 for the PC 101 keyboard.

The VT100 Terminal Definition is the standard convention used to configure and conduct emergency management tasks with UNIX-based servers. VT100 does not support all keys on the standard PC 101-key layout, however. The VT-UTF8 convention makes available additional keys that are not provided by VT100 for the PC 101 keyboard.

➔ **Disabled**		Disables the VT-UTF8 terminal keys
➔ **Enabled**	**DEFAULT**	Enables the VT-UTF8 combination key. Support for ANSI/VT100 terminals

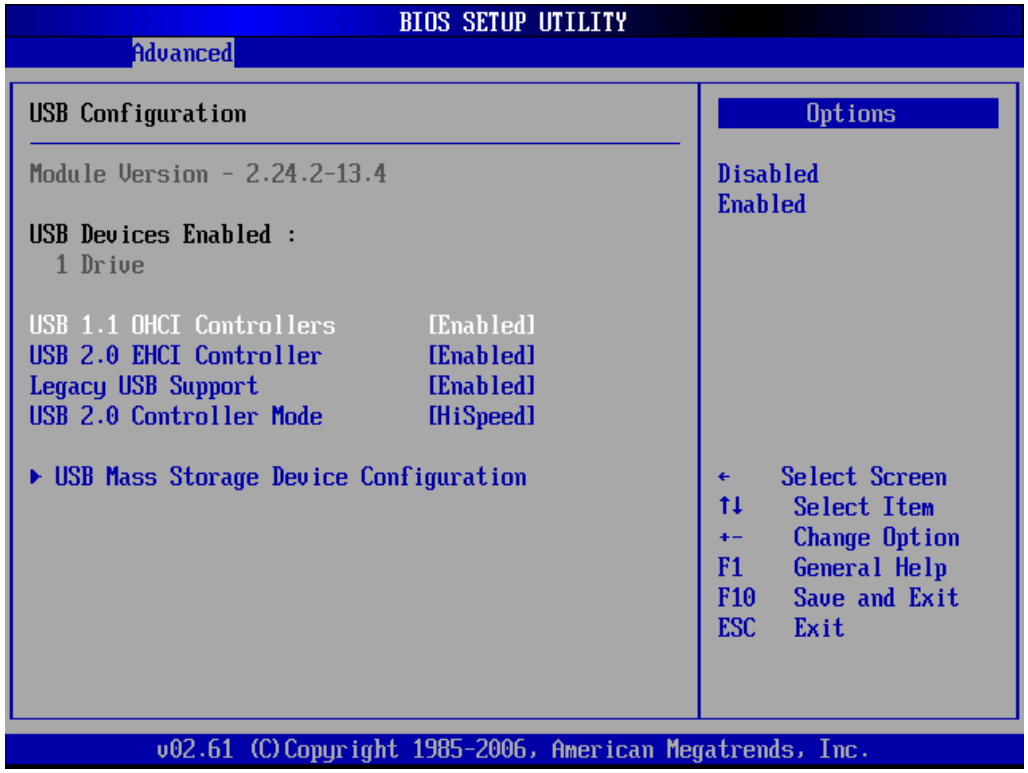
➔ **Sredir Memory Display Delay [No Delay]**

Use the **Sredir Memory Display Delay** option to select the delay before memory information is displayed. Configuration options are listed below

- No Delay **DEFAULT**
- Delay 1 sec
- Delay 2 sec
- Delay 4 sec

6.3.10 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 13**) to read USB configuration information and configure the USB settings.



BIOS Menu 13: USB Configuration

➔ **USB 1.1 OHCI Controller [Enabled]**

The **USB 1.1 OHCI Controller** BIOS option enables or disables the USB 1.1 controller

➔ **Disabled**		USB 1.1 function disabled
➔ **Enabled**	**DEFAULT**	USB 1.1 function enabled

➔ **USB 2.0 EHCI Controller [Enabled]**

The **USB 2.0 EHCI Controller** BIOS option enables or disables the USB 2.0 controller

➔ **Disabled**		USB EHCI function disabled
➔ **Enabled**	**DEFAULT**	USB function enabled

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Disabled**		Legacy USB support disabled
➔ **Enabled**	**DEFAULT**	Legacy USB support enabled
➔ **Auto**		Legacy USB support disabled if no USB devices are connected

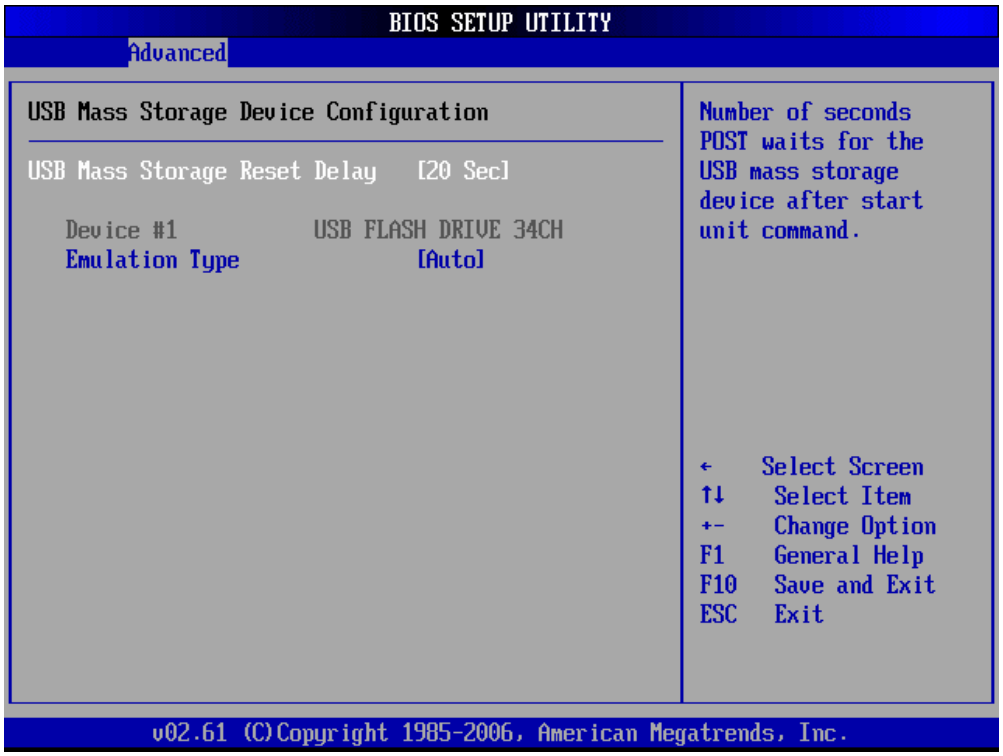
➔ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

➔ **FullSpeed**		The controller is capable of operating at 12Mb/s
➔ **HiSpeed**	**DEFAULT**	The controller is capable of operating at 480Mb/s

6.3.10.1 USB Mass Storage Device Configuration

Use the **USB Mass Storage Device Configuration** menu (**BIOS Menu 14**) to configure USB mass storage class devices.


BIOS SETUP UTILITY
Advanced
USB Mass Storage Device Configuration
USB Mass Storage Reset Delay [20 Sec]
Device #1 USB FLASH DRIVE 34CH
Emulation Type [Auto]
Number of seconds POST waits for the USB mass storage device after start unit command.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 14: USB Mass Storage Device Configuration

➔ **USB Mass Storage Reset Delay [20 Sec]**

Use the **USB Mass Storage Reset Delay** option to set the number of seconds POST waits for the USB mass storage device after the start unit command.

➔ **10 Sec**		POST waits 10 seconds for the USB mass storage device after the start unit command.
➔ **20 Sec**	**DEFAULT**	POST waits 20 seconds for the USB mass storage device after the start unit command.
➔ **30 Sec**		POST waits 30 seconds for the USB mass storage

device after the start unit command.

➔ **40 Sec** POST waits 40 seconds for the USB mass storage device after the start unit command.

➔ **Device ##**

The **Device##** field lists the USB devices that are connected to the system.

➔ **Emulation Type [Auto]**

Use the **Emulation Type** BIOS option to specify the type of emulation BIOS has to provide for the USB device.

NOTE:

Please note that the device's formatted type and the emulation type provided by the BIOS must match for a device to boot properly. If both types do not match then device's behavior is undefined. To make sure both types match, format the device using BIOS INT13h calls after selecting the proper emulation option in BIOS setup. The FORMAT utility provided by Microsoft® MS-DOS®, Microsoft® Windows® 95, and Microsoft® Windows® 98 can be used for this purpose.

➔ **Auto** **DEFAULT** BIOS auto-detects the current USB.

➔ **Floppy** The USB device will be emulated as a floppy drive. The device can be either A: or B: responding to INT13h calls that return DL = 0 or DL = 1 respectively.

➔ **Forced FDD** Allows a hard disk image to be connected as a

floppy image. This option works only for drives formatted with FAT12, FAT16 or FAT32.

➔ **Hard Disk** Allows the USB device to be emulated as hard disk responding to INT13h calls that return DL values of 80h or above.

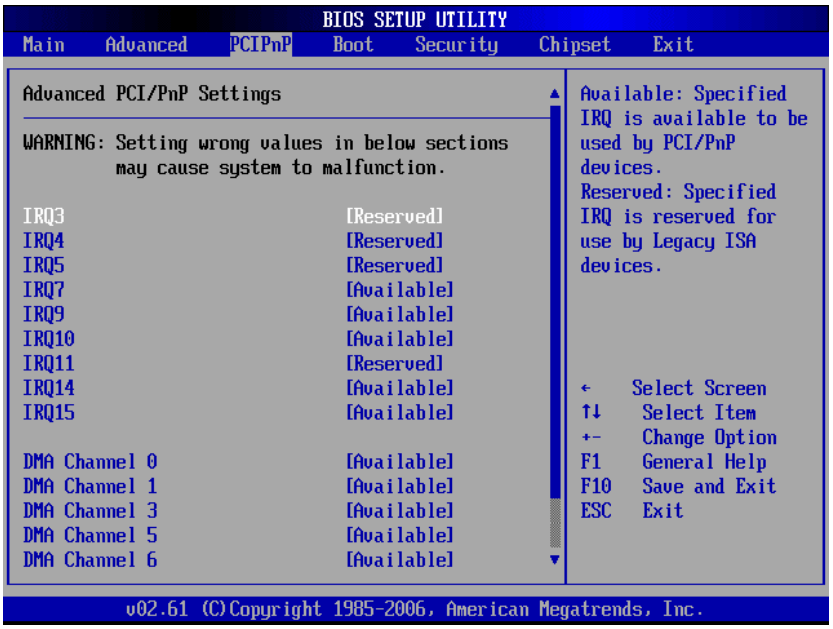
➔ **CDROM** Assumes the CD-ROM is formatted as bootable media. All the devices that support block sizes greater than 512 bytes can only be booted using this option.

6.4 PCI/PnP

Use the PCI/PnP menu (**BIOS Menu 15**) to configure advanced PCI and PnP settings.

WARNING:

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.



BIOS Menu 15: PCI/PnP Configuration

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by

PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available** **DEFAULT** The specified DMA is available to be used by PCI/PnP devices

➔ **Reserved** The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

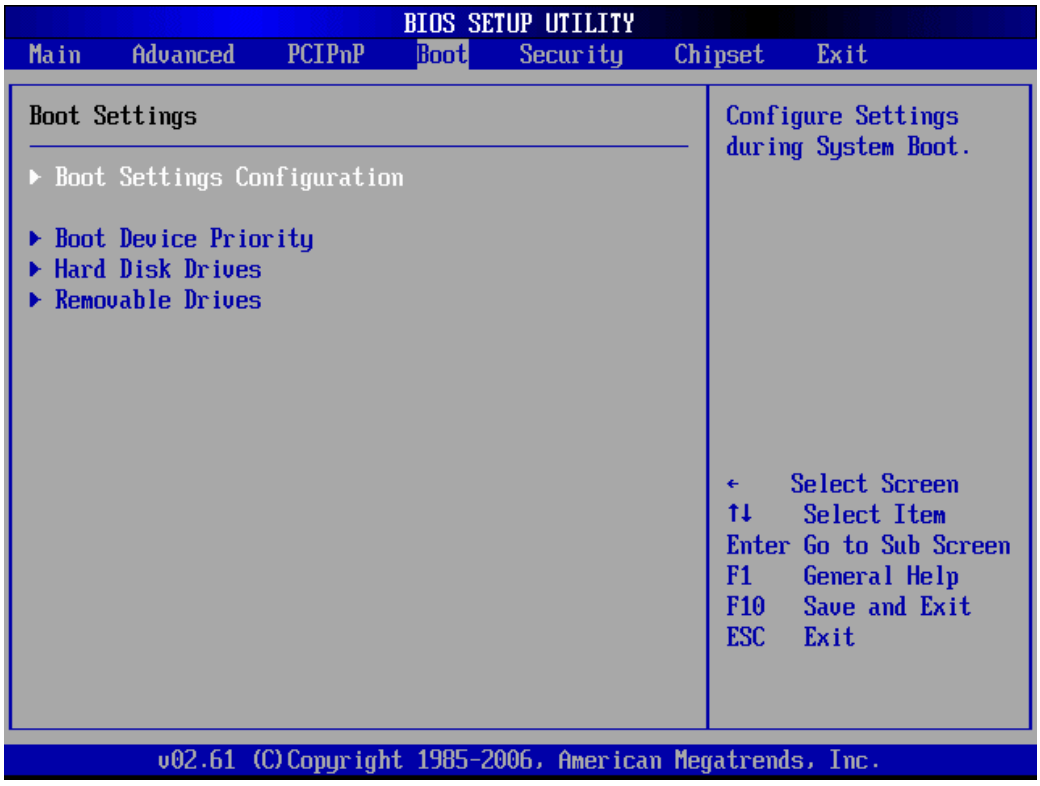
➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔	**Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔	**16K**		16KB reserved for legacy ISA devices
➔	**32K**		32KB reserved for legacy ISA devices
➔	**64K**		54KB reserved for legacy ISA devices

6.5 Boot

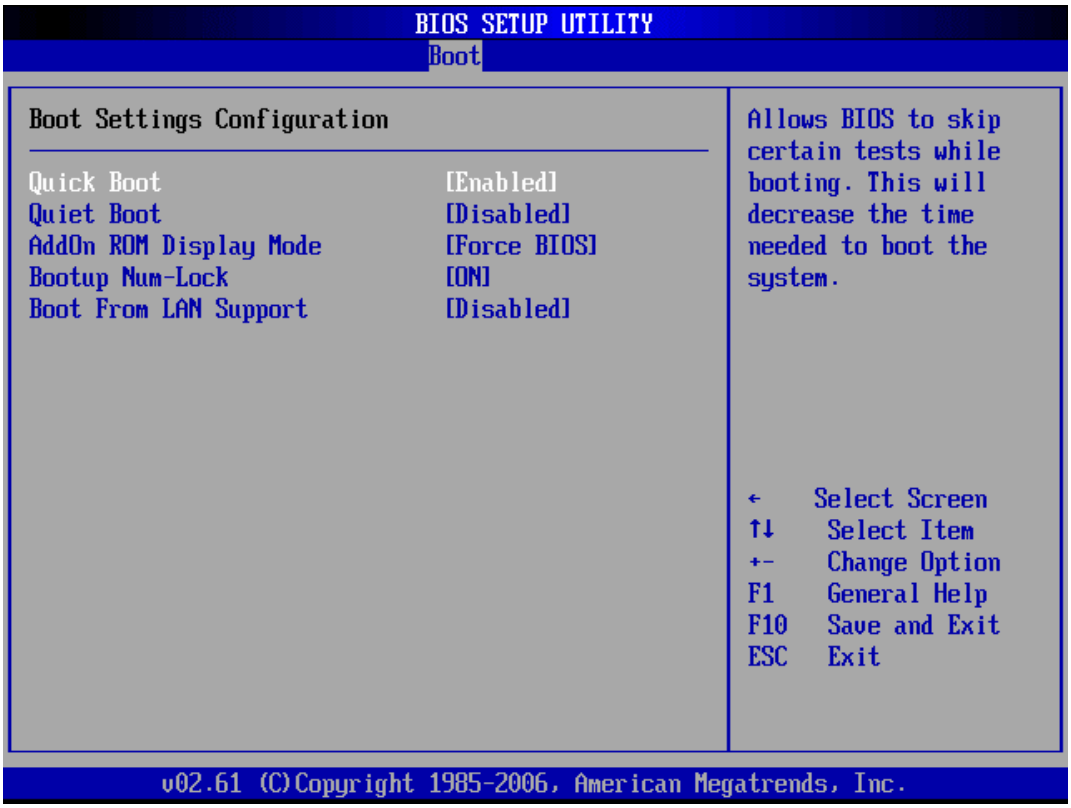
Use the Boot menu (**BIOS Menu 16**) to configure system boot options.



BIOS Menu 16: Boot

6.5.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (**BIOS Menu 16**) to configure advanced system boot options.


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [ON]
Boot From LAN Support [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 17: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled** **DEFAULT** Normal POST messages displayed

➔ **Enabled** OEM Logo displayed instead of POST messages

➔ AddOn ROM Display Mode [Force BIOS]

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS** **DEFAULT** The system forces third party BIOS to display during system boot.

➔ **Keep Current** The system displays normal information during system boot.

➔ Bootup Num-Lock [On]

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Boot From LAN Support [Disabled]**

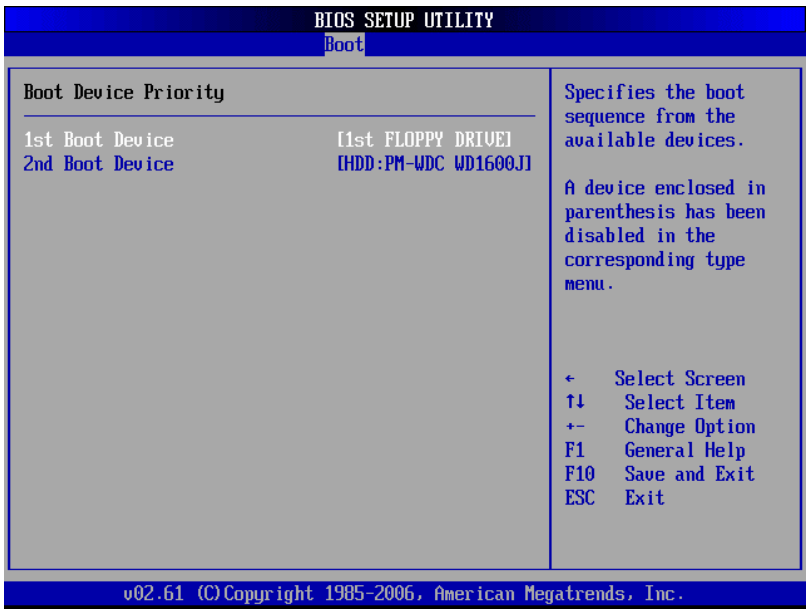
Use the **BOOT From LAN Support** option to enable the system to be booted from a remote system.

➔ **Disabled**	**DEFAULT**	Cannot be booted from a remote system through the LAN
➔ **Enabled**		Can be booted from a remote system through the LAN

6.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 18**) to specify the boot sequence from the available devices. Possible boot devices may include:

- 1st FLOPPY DRIVE
- HDD
- CD/DVD


BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device [1st FLOPPY DRIVE]
2nd Boot Device [HDD:PM-WDC WD1600J]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 18: Boot Device Priority Settings

6.5.3 Hard Disk Drives

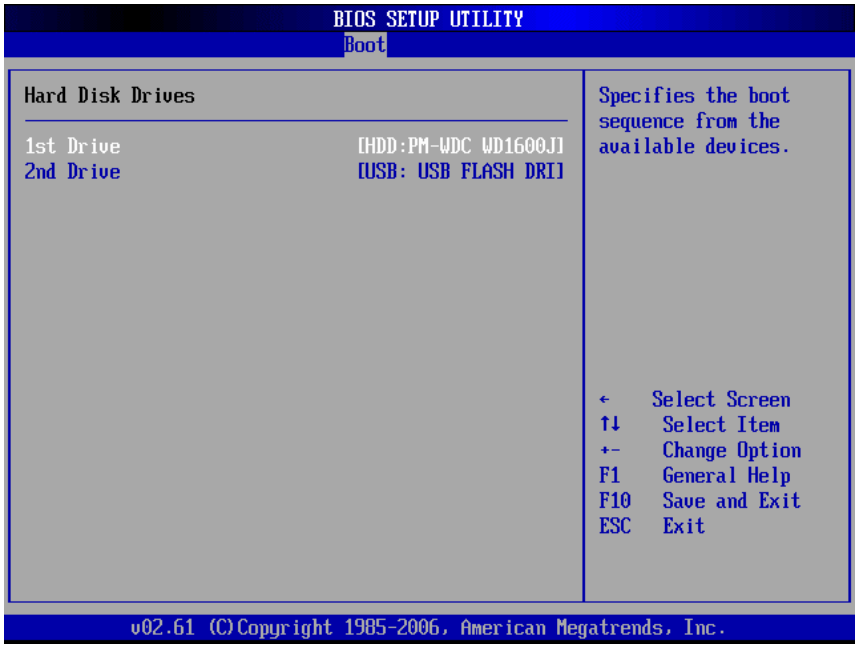
Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs. When the menu is opened, the HDDs connected to the system are listed as shown below:

- 1st Drive [HDD: PM-(part number)]
- 2nd Drive [HDD: PS-(part number)]

NOTE:

Only the drives connected to the system are shown. For example, if only two HDDs are connected only "**1st Drive**" and "**2nd Drive**" are listed.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available HDDs is shown. Select the first HDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.



BIOS Menu 19: Hard Disk Drives

6.5.4 Removable Drives

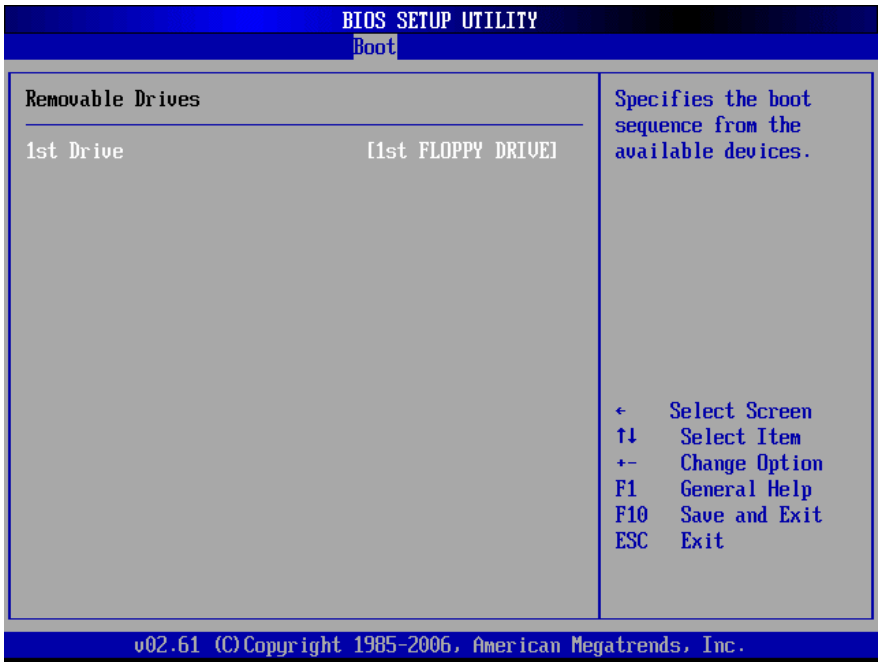
Use the **Removable Drives** menu (**BIOS Menu 20**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

- 1st Drive [1st FLOPPY DRIVE]

NOTE:

Only the drives connected to the system are shown. For example, if only one FDD is connected only "**1st Drive**" is listed.

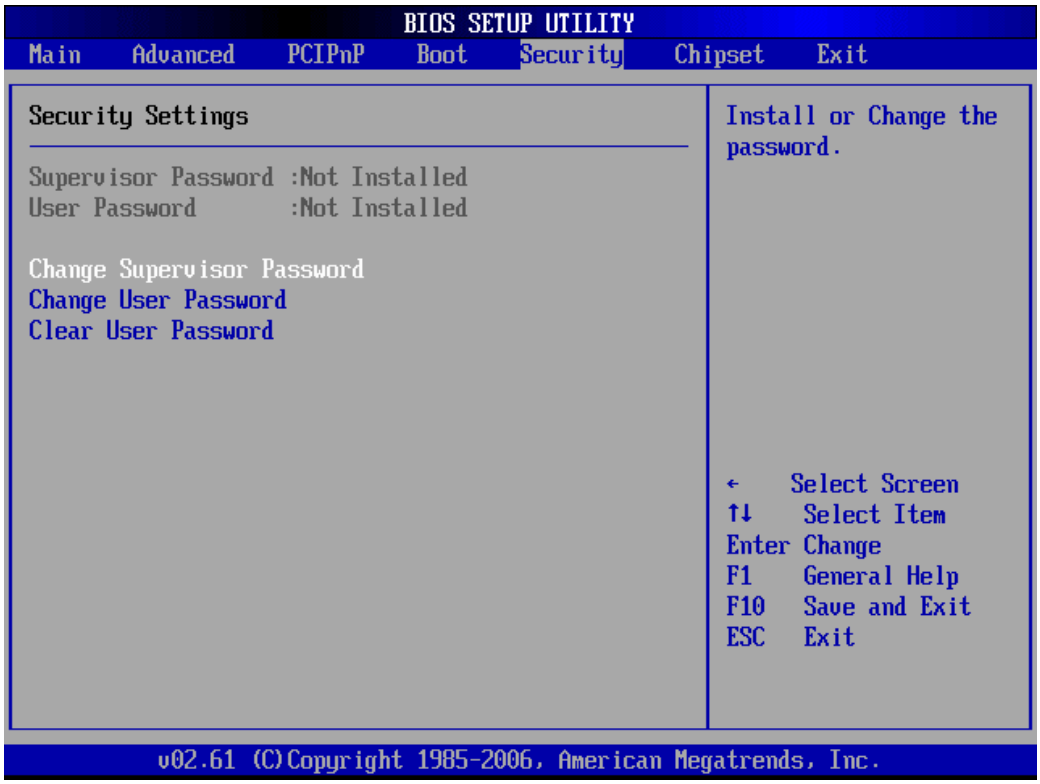
The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available FDDs is shown. Select the first FDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.



BIOS Menu 20: Removable Drives

6.6 Security

Use the Security menu (**BIOS Menu 21**) to set system and user passwords.



BIOS Menu 21: Security

➔ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the

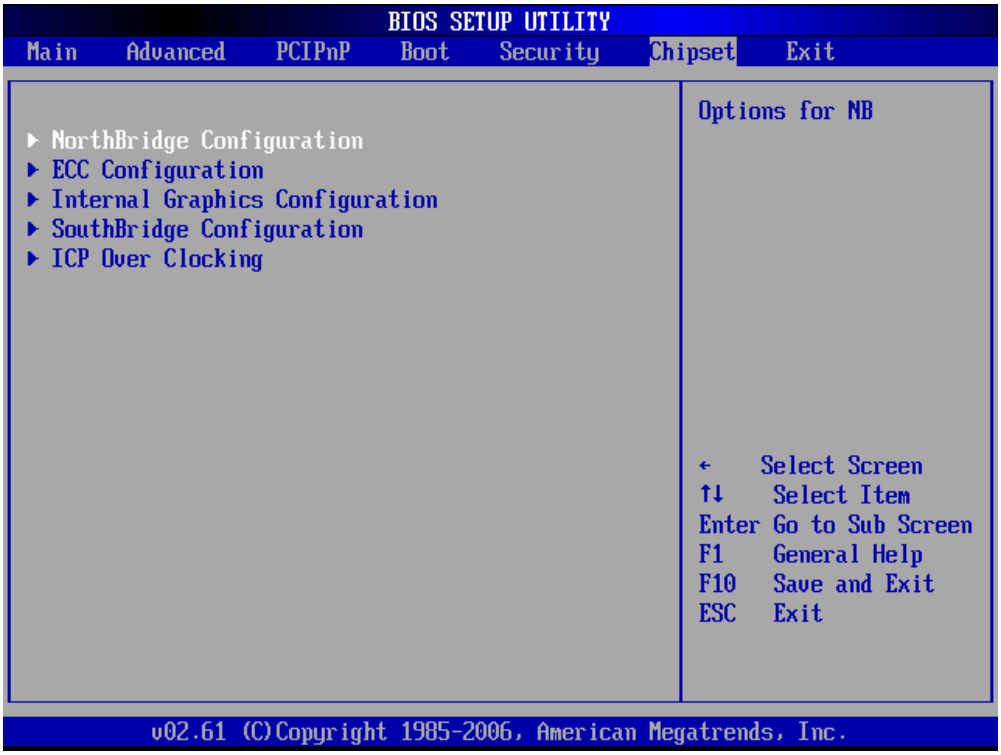
password. After the password has been added, **Install** appears next to **Change User Password**.

6.7 Chipset

Use the **Chipset** menu (**BIOS Menu 22**) to access the NorthBridge and SouthBridge configuration menus

WARNING!

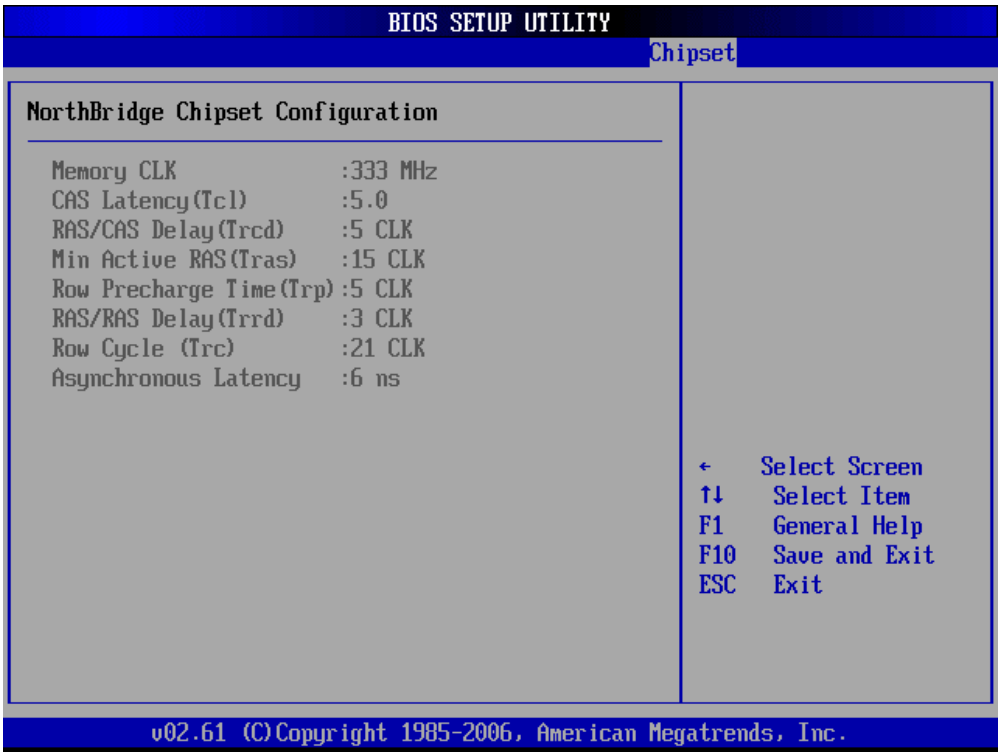
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 22: Chipset

6.7.1 NorthBridge Chipset Configuration

Use the NorthBridge Chipset Configuration menu (**BIOS Menu 23**) to check the Northbridge chipset settings.



BIOS Menu 23:NorthBridge Chipset Configuration

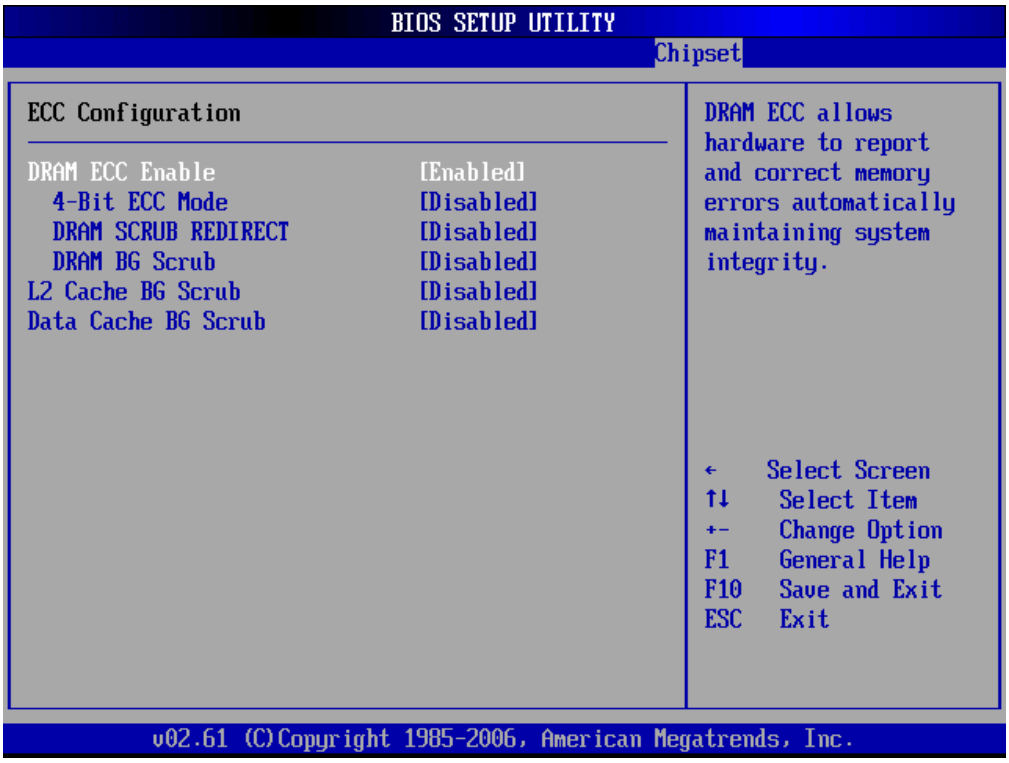
The NorthBridge Chipset configuration menu has no configurable options. The NorthBridge Chipset configuration menu shows the following Northbridge chipset settings:

- **Memory CLK**: Shows the speed of the memory controller
- **CAS (Latency)**: Specifies the Column Address Strobe (CAS) delay time
- **RAS/CAS Delay(Trcd):** Specifies the number of clock cycles that must elapse between sending a RAS (row address strobe) signal and the CAS (column address strobe) signal.
- **Min Active RAS (Tras)**: Specifies the speed at which the RAM terminates the access of one row and start accessing another.
- **Row Precharge Time(Trp)**: Specifies the length of the delay between the activation and precharge commands for the RAS signal.

- **RAS/RAS Delay(Trrd)**
- **Row Cycle (Trc)**
- **Asynchronous Latency**

6.7.2 ECC Configuration

Use the **ECC Configuration** menu (**BIOS Menu 24**) to set the ECC parameters.


BIOS SETUP UTILITY
Chipset
ECC Configuration
DRAM ECC Enable [Enabled]
4-Bit ECC Mode [Disabled]
DRAM SCRUB REDIRECT [Disabled]
DRAM BG Scrub [Disabled]
L2 Cache BG Scrub [Disabled]
Data Cache BG Scrub [Disabled]
DRAM ECC allows hardware to report and correct memory errors automatically maintaining system integrity.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.

BIOS Menu 24: ECC Configuration Chipset Configuration

➔ **DRAM ECC Enable [Enabled]**

Use the **DRAM ECC Enable** option to enable the hardware to report and correct memory errors and thereby automatically maintain the system.

➔ **Disabled** System cannot report and correct memory errors

➔ **Enabled** **DEFAULT** System can report and correct memory errors

➔ **4-Bit ECC Mode [Disabled]**

Use the **4-Bit ECC Mode** to enable or disable the 4-Bit ECC mode (a.k.a. CHIPKILL ECC MODE)

➔ **Disabled**	**DEFAULT**	4-Bit ECC mode disabled
➔ **Enabled**		4-Bit ECC mode enabled

➔ **DRAM SCRUB REDIRECT [Disabled]**

Use the **DRAM SCRUB REDIRECT** option to enable the system to immediately correct DRAM ECC errors when they occur, even when background scrubbing is on.

➔ **Disabled**	**DEFAULT**	System cannot immediately correct DRAM ECC errors
➔ **Enabled**		System cannot immediately correct DRAM ECC errors

➔ **DRAM BG Scrub [Disabled]**

Use the **DRAM BG Scrub** option to enable the system to immediately correct memory errors so later reads are correct. Doing this while memory is not being used improves performance.

NOTE:

When the AMD node interleave feature is enabled, BIOS will force DRAM scrub off.

➔ **Disabled**	**DEFAULT**	System cannot immediately correct memory errors
➔ **Enabled**		System cannot immediately correct memory errors

➔ **L2 Cache BG Scrub [Disabled]**

Use the **L2 Cache BG Scrub** option to enable the system to correct the L2 Data cache when idle.

➔	**Disabled**	**DEFAULT**	L2 cache can be corrected when the system is idle.
➔	**Enabled**		L2 cache cannot be corrected when the system is idle.

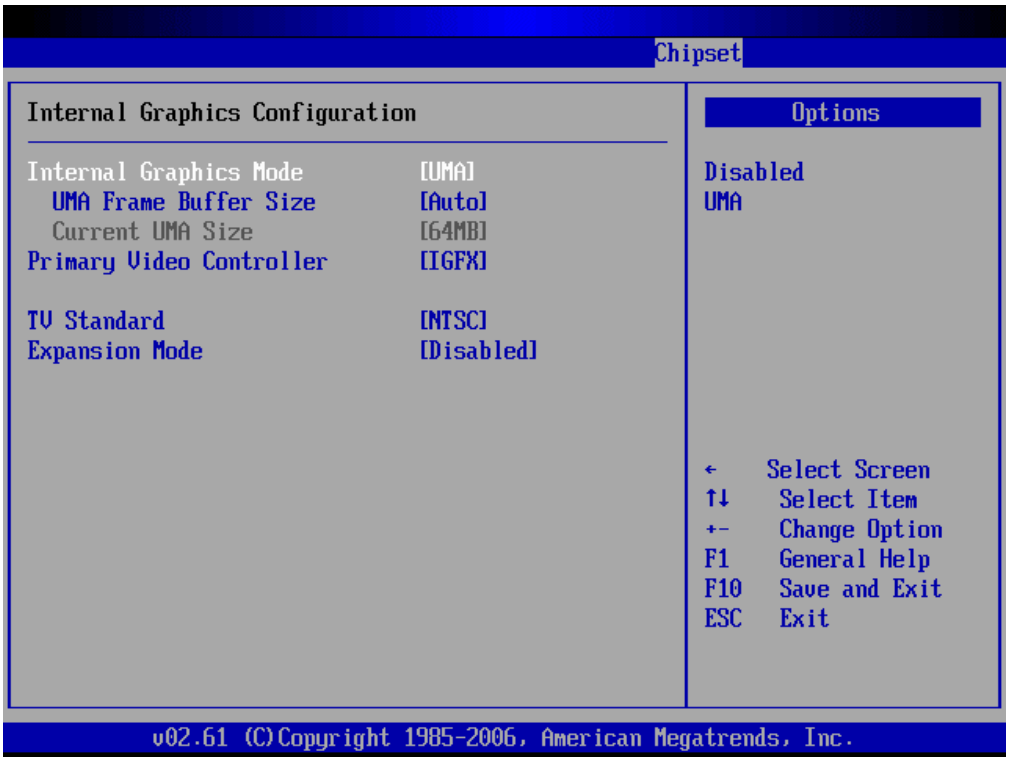
➔ **Data Cache BG Scrub [Disabled]**

Use the **Data Cache BG Scrub** option to enable the system to correct the Data cache when idle.

➔	**Disabled**	**DEFAULT**	Data cache can be corrected when the system is idle.
➔	**Enabled**		Data cache cannot be corrected when the system is idle.

6.7.3 Internal Graphics Configuration

Use the **Internal Graphics Configuration** (**BIOS Menu 25**) menu to set the integrated graphics.



BIOS Menu 25: Internal Graphics Configuration

➔ **Internal Graphics Mode [UMA]**

Use the **Internal Graphic Mode Select** option to how the internal graphics accesses the memory.

➔ **Disabled**		The internal graphics mode is disabled.
➔ **SIDEPORT**		The integrated graphics core treats the SidePort memory as its local memory
➔ **UMA**	**DEFAULT**	The integrated graphics can only access a dynamically allocated partition of system memory.
➔ **UMA + SIDEPORT**		The integrated graphics core first uses SidePort memory and then system memory. If more memory is needed, the driver allocates memory

dynamically through the system memory.

➔ **UMA Frame Buffer Size [Auto]**

Use the **UMA Frame Buffer Size** option to specify the memory to be reserved for the integrated graphics. The following configuration options are available:

- Auto **DEFAULT**
- 32MB
- 64MB
- 128MB
- 256MB
- 512MB
- 1024MB

➔ **Current UMA Buffer Size [64MB]**

The current UMA Buffer Size field specifies the amount of memory that is allocated to the integrated graphics.

➔ **Primary Video Controller [IGFX]**

Use the **Primary Video Controller** option to select the primary video graphics controller the system uses. The following options are available:

- PCIE
- PCI
- IGFX

➔ **TV Standard [NTSC]**

Use the **TV Standard** option to specify the TV type connected to the system.

➔ **NTSC**	**DEFAULT**	TV type is set to NTSC
➔ **PAL**		TV type is set to PAL
➔ **PAL-M**		TV type is set to PAL-M

➔ **PAL-N**		TV type is set to PAL-N

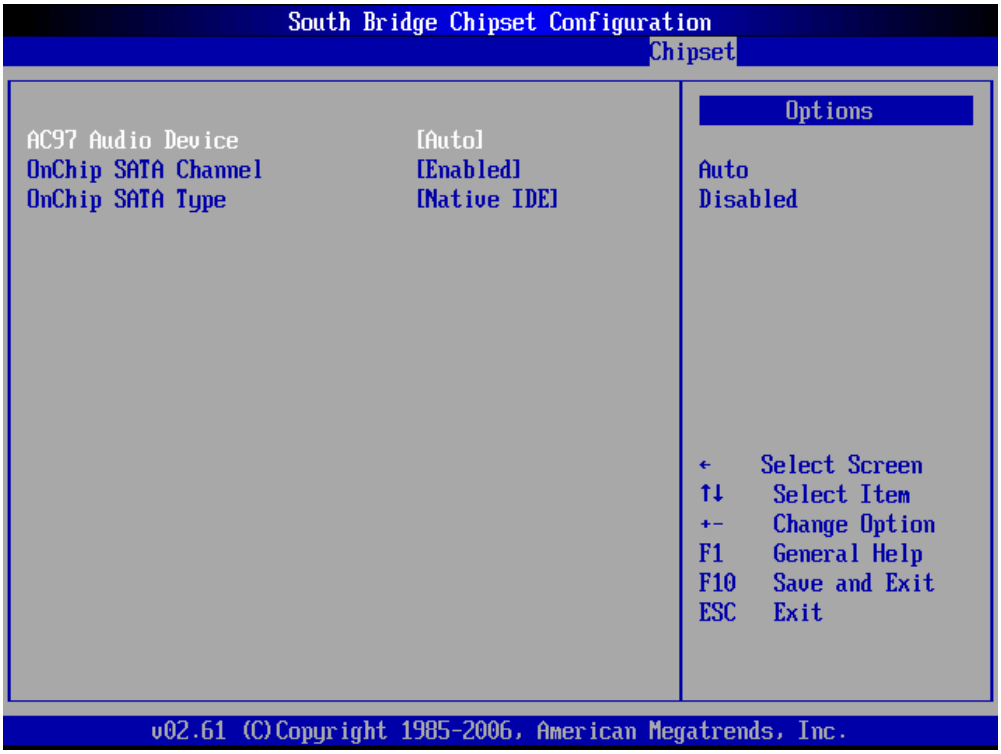
➔ **Expansion Mode [Disabled]**

Use the **Expansion Mode** option to enable or disable the expansion mode.

➔ **Disabled**	**DEFAULT**	Expansion mode disabled
➔ **Enabled**		Expansion mode enabled

6.7.4 SouthBridge Configuration

Use the SouthBridge Configuration menu (**BIOS Menu 26**) to configure the Southbridge chipse.



BIOS Menu 26:SouthBridge Chipset Configuration

➔ **AC97 Audio Device [Auto]**

Use the **AC97 Audio Device** option to enable or disable the AC'97 CODEC.

➔ **Disabled**		The onboard AC'97 is disabled
➔ **Auto**	**DEFAULT**	The onboard AC'97 automatically detected and enabled

➔ **OnChip SATA Channel [Enabled]**

Use the **OnChip SATA Channel** option to enable or disable the SATA controller on the Southbridge.

➔ **Disabled**		Disables the Southbridge SATA controller.
➔ **Enabled**	**DEFAULT**	Enables the Southbridge SATA controller.

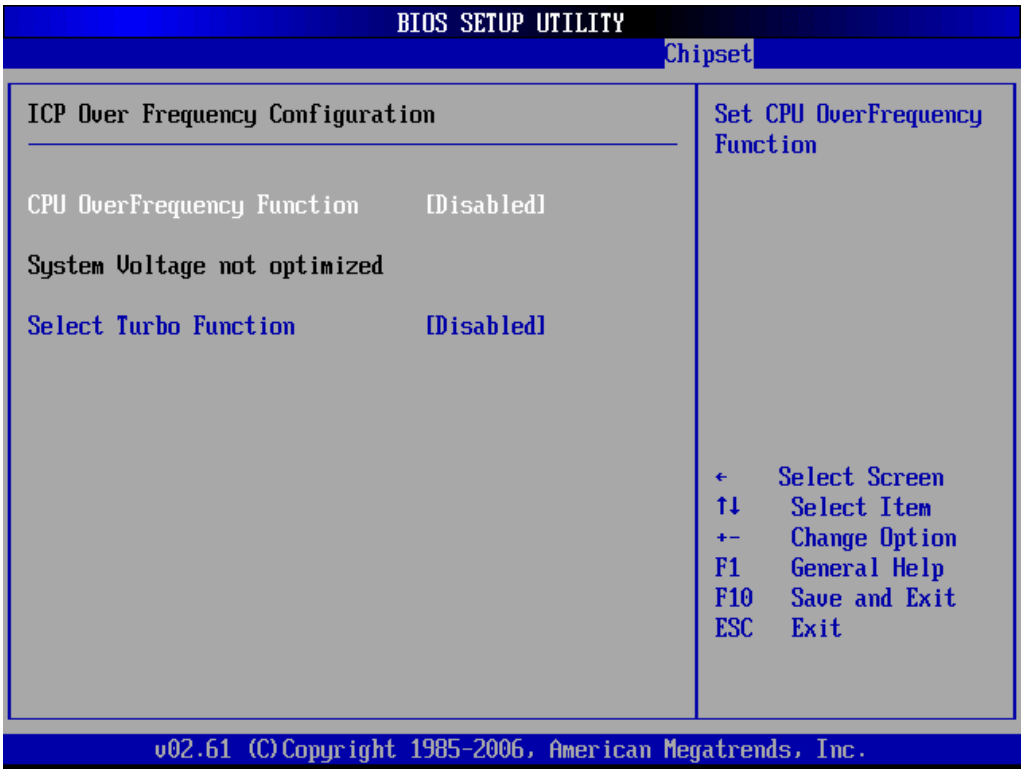
➔ **OnChip SATA Type [Native IDE]**

Use the **OnChip SATA Type** option to specify the drive type that is installed in the system/ The following options are available:

- Native IDE **DEFAULT**
- RAID
- AHCI
- Legacy IDE
- IDE → AHCI

6.7.5 CPU Over Frequency Function

Use the CPU Over Frequency Funcion menu (**BIOS Menu 27**) to disable or enable the over frequency funciton.



BIOS Menu 27: ICP Over Clocking

➔ **CPU OverFrequency Function [Disabled]**

Use the **CPU OverFrequency Function** option to disable the CPU over frequency function or select the over frequency percentage. The following options are available:

- Disabled **DEFAULT**
- 2% Over Frequency
- 5% Over Frequency
- 10% Over Frequency
- 15% Over Frequency
- 20% Over Frequency
- 25% Over Frequency
- 30% Over Frequency
- 35% Over Frequency
- 40% Over Frequency

➔ **Select Turbo Function [Disabled]**

Use the **Select Turbo Function** option to enable or disable the turbo function.

➔ **Disabled**	**DEFAULT**	Disables the turbo function.
➔ **Enabled**		Enables the turbo function.

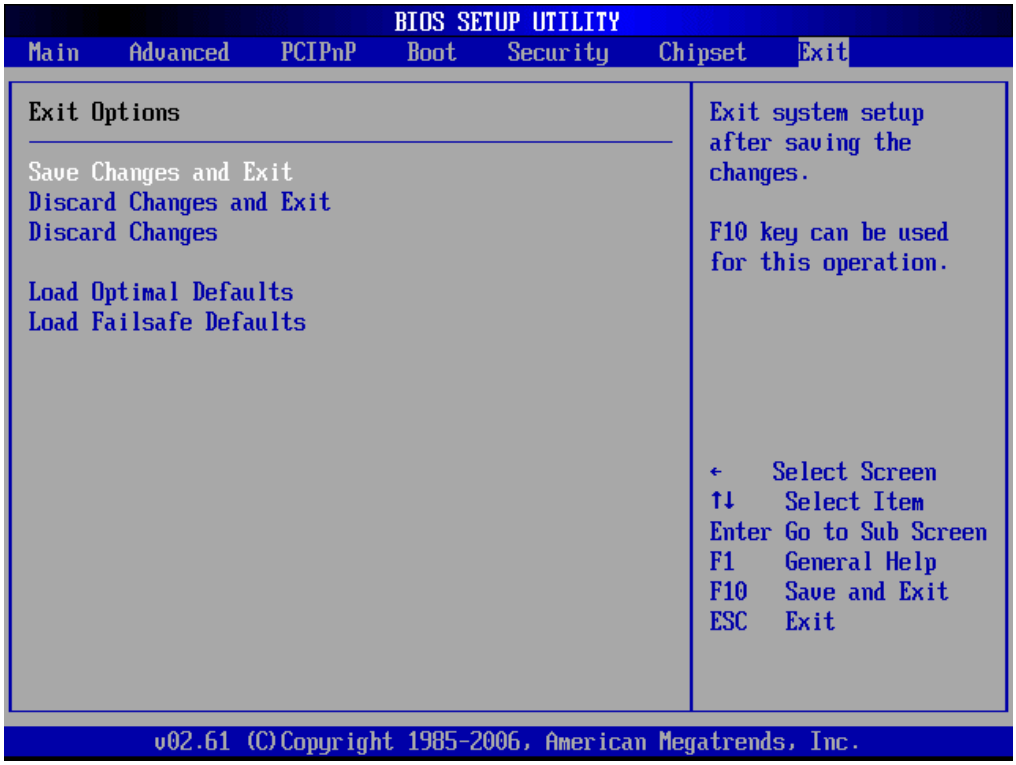
➔ **Select DDR2 OverVoltage [1.82V]**

The **Select DDR2 OverVoltage** option is available when **Select Turbo Function** is enabled. Use **Select DDR2 OverVoltage** option to select the voltage for DDR2. The following options are available:

- 1.74V
- 1.78V
- 1.82V **DEFAULT**
- 1.86V
- 1.90V
- 1.94V
- 1.98V
- 2.02V
- 2.06V
- 2.10V
- 2.14V
- 2.18V
- 2.22V
- 2.26V
- 2.30V
- 2.34V

6.8 Exit

Use the **Exit** menu (**BIOS Menu 28**) to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 28:Exit

➔ Save Changes and Exit

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ Discard Changes and Exit

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

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Chapter

7

Software Drivers

7.1 Available Software Drivers

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- AMD chipset driver
- LAN driver
- Audio driver

Installation instructions are given below.

7.2 Driver CD Auto-run

All the drivers for the IMBA-690AM2 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

NOTE:

If the system does not initiate the "autorun" program when the CD is inserted, click the **Start** button, select **Run**, then type **X:\autorun.exe** (where **X:** is the system CD drive) to access the IEI Driver CD main menu.

Step 2: The driver main menu appears (**Figure 7-1**).

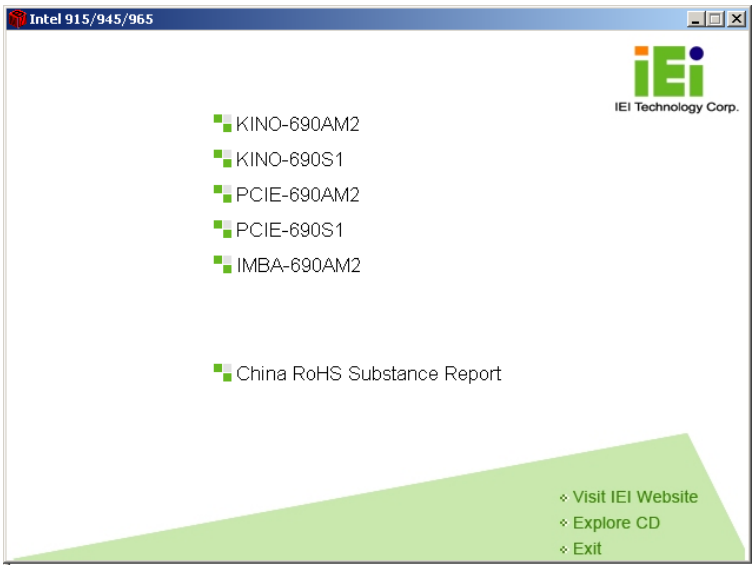

Figure 7-1: Introduction Screen

Step 3: Click IMBA-690AM2.

Step 4: A new screen with a list of available drivers appears (**Figure 7-2**).

Figure 7-2: Available Drivers

Step 5: Select the driver to install from the list in **Figure 7-2**. Detailed driver installation instructions follow below.

7.3 AMD 690G Chipset Driver Installation

To install the chipset driver, please follow the steps below.

NOTE:

The chipset driver control center requires Microsoft .NET Framework prior to installation. The driver control center is an application that allows a user to control the configuration of the AMD product. To verify .NET Framework, check the Add/Remove Programs list in the Control Panel. If the .NET Framework is not listed, please download, and install it.

Step 1: Select **Chipset** from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-3**).

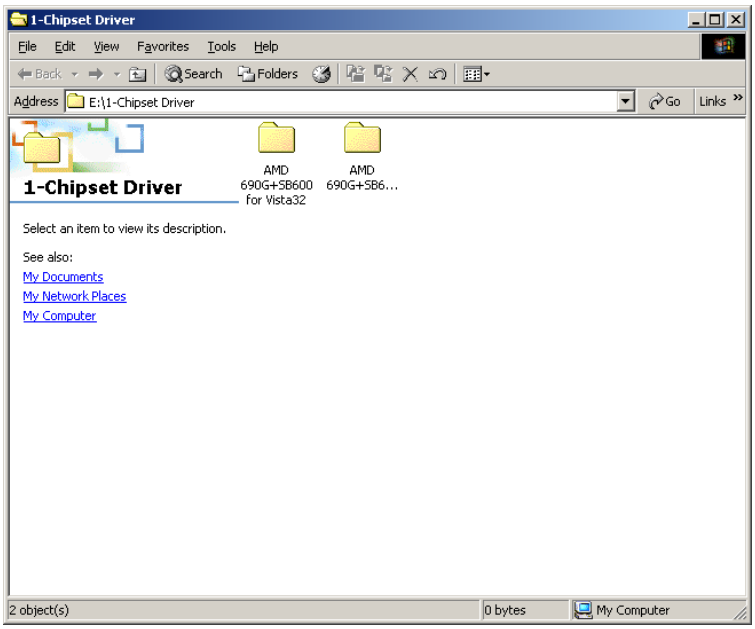

Figure 7-3: Chipset Driver Installation Program

Step 3: Double-click the directory icon for the operating system that is running on the system.

Step 4: The screen in **Figure 7-4** appears.

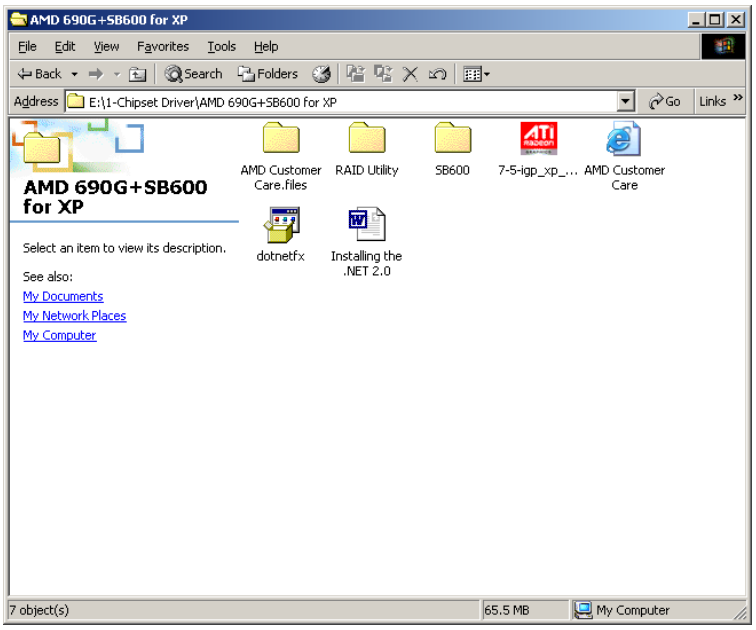

Figure 7-4: Chipset Driver Installation Welcome Screen

Step 5: Open the **SB600** directory. The screen in **Figure 7-5** appears.

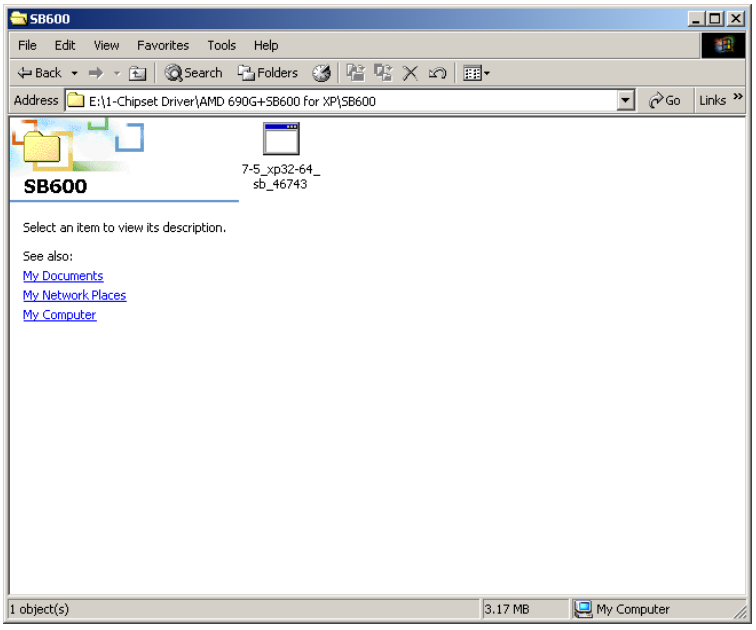

Figure 7-5: Chipset Driver Installation License Agreement

Step 6: The screen in **Figure 7-6** appears. Select the destination folder.

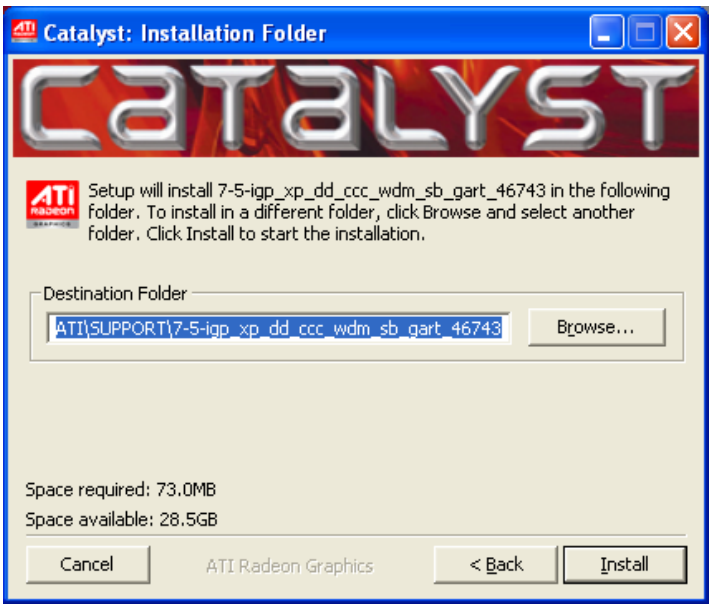

Figure 7-6: Select Destination Folder

Step 7: Click install to continue.

Step 8: The screen in **Figure 7-7** appears as the driver starts to install.

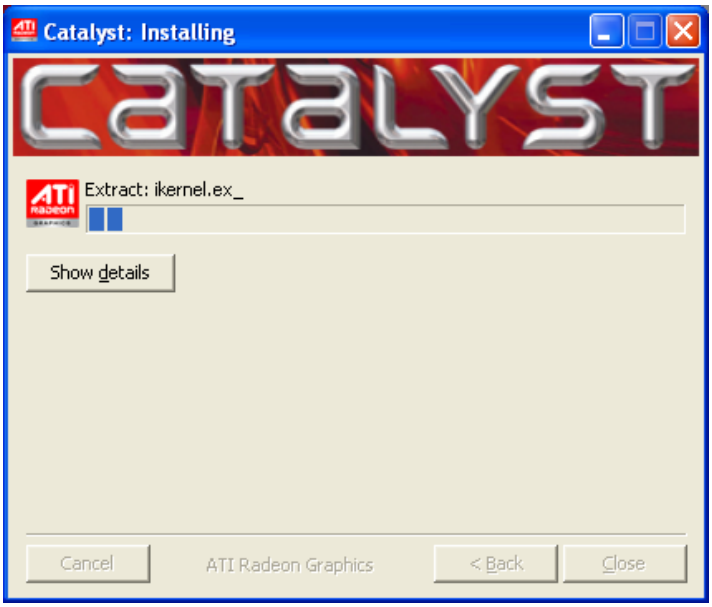

Figure 7-7: Chipset Driver Installing Screen

Step 9: The welcome screen shown in **Figure 7-8** appears.

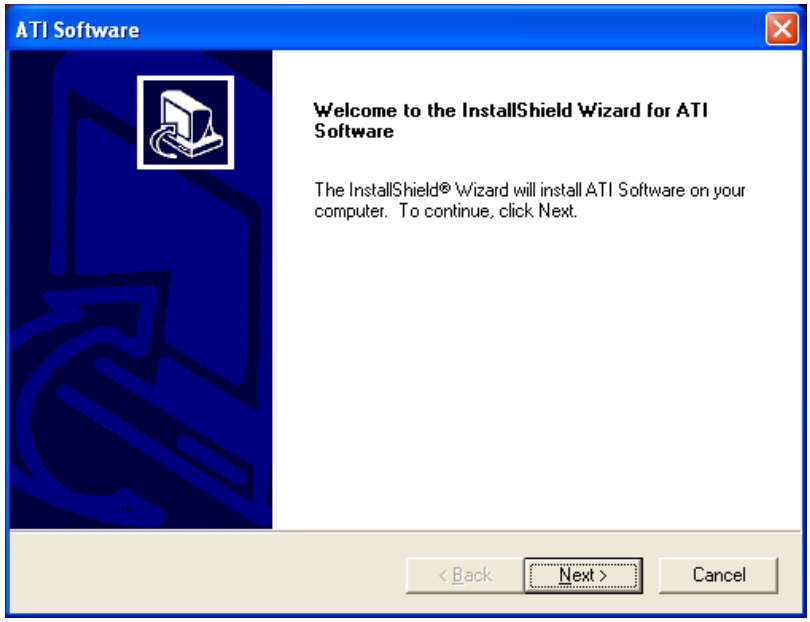
ATI Software
Welcome to the InstallShield Wizard for ATI Software
The InstallShield® Wizard will install ATI Software on your computer. To continue, click Next.
< Back
Next >
Cancel

Figure 7-8: Welcome Screen

Step 10: Click **YES** to continue.

Step 11: The License agreement file in Figure 7-9 appears.

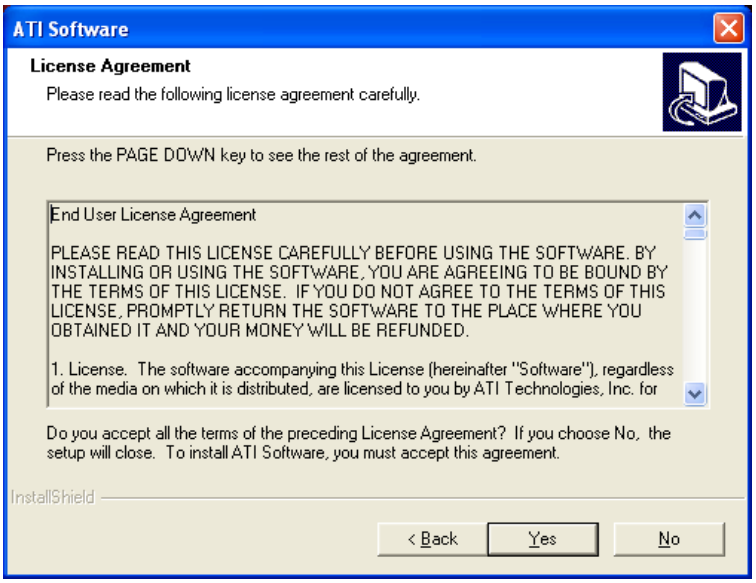
ATI Software
License Agreement
Please read the following license agreement carefully.
Press the PAGE DOWN key to see the rest of the agreement.
End User License Agreement
PLEASE READ THIS LICENSE CAREFULLY BEFORE USING THE SOFTWARE. BY INSTALLING OR USING THE SOFTWARE, YOU ARE AGREEING TO BE BOUND BY THE TERMS OF THIS LICENSE. IF YOU DO NOT AGREE TO THE TERMS OF THIS LICENSE, PROMPTLY RETURN THE SOFTWARE TO THE PLACE WHERE YOU OBTAINED IT AND YOUR MONEY WILL BE REFUNDED.
1. License. The software accompanying this License (hereinafter "Software"), regardless of the media on which it is distributed, are licensed to you by ATI Technologies, Inc. for
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install ATI Software, you must accept this agreement.
InstallShield
< Back
Yes
No

Figure 7-9: Chipset Driver Readme File Information

Step 12: Click **YES** to continue.

Step 13: The screen in **Figure 7-10** appears.

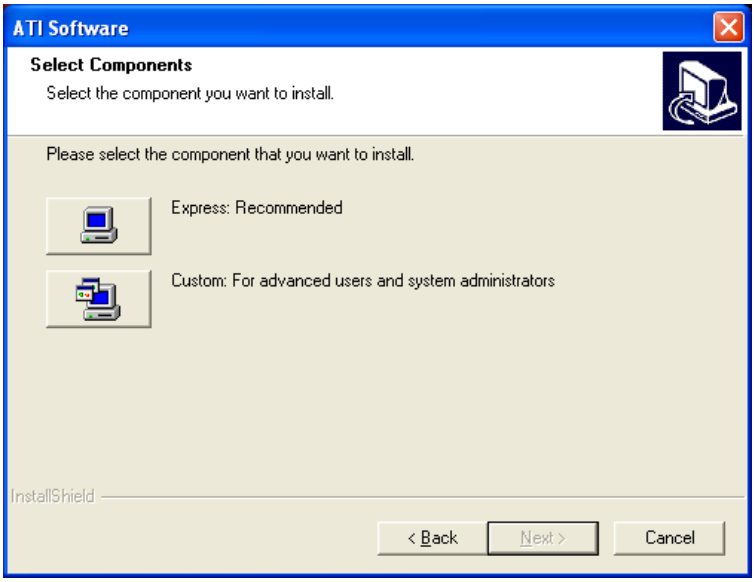

Figure 7-10: Chipset Driver Installation Complete

Step 14: Select the installation type (Express or Custom) then click Next to continue.

Step 15: The installer starts to load the display driver.

Step 16: Next the WDM Capture drivers load (for VIVO or All-In-Wonder)

Step 17: The Catalyst Control Center setup starts shortly after.

Step 18: A dialog box indicates the install progress.

Step 19: When the installation is complete the **Setup Complete** screen in **Figure 7-11** appears.

Setup Complete
Setup has finished copying files to your computer.
Before you can use the program, you must restart Windows or your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Finish

Figure 7-11: Setup Complete

Step 20: To complete the installation, click **Finish**.

7.4 Broadcom LAN Driver (for GbE LAN) Installation

To install the Broadcom LAN driver, please follow the steps below.

Step 1: Open **Windows Control Panel (Figure 7-12**).

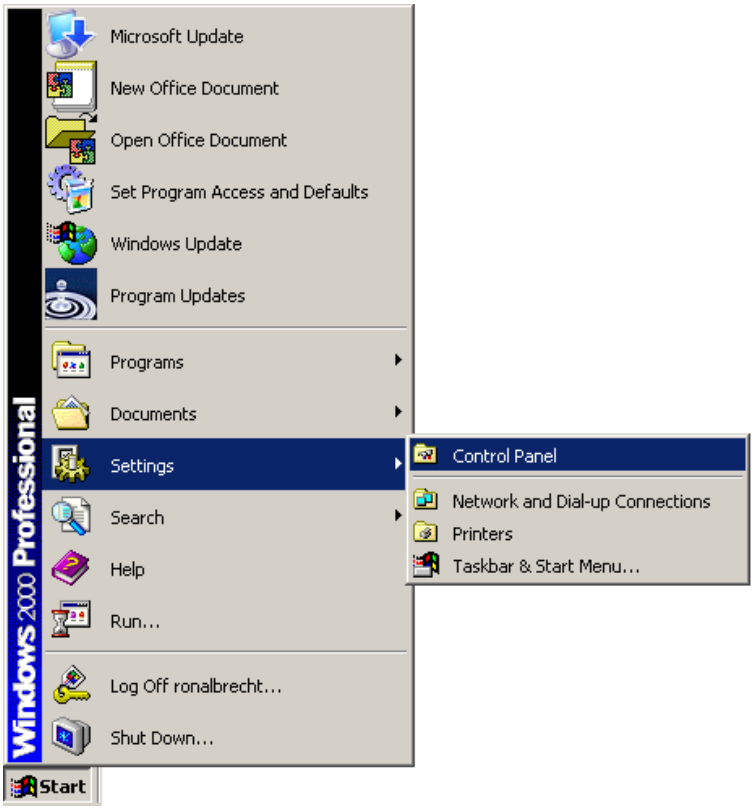

Figure 7-12: Windows Control Panel

Step 2: Double-click the **System** icon.

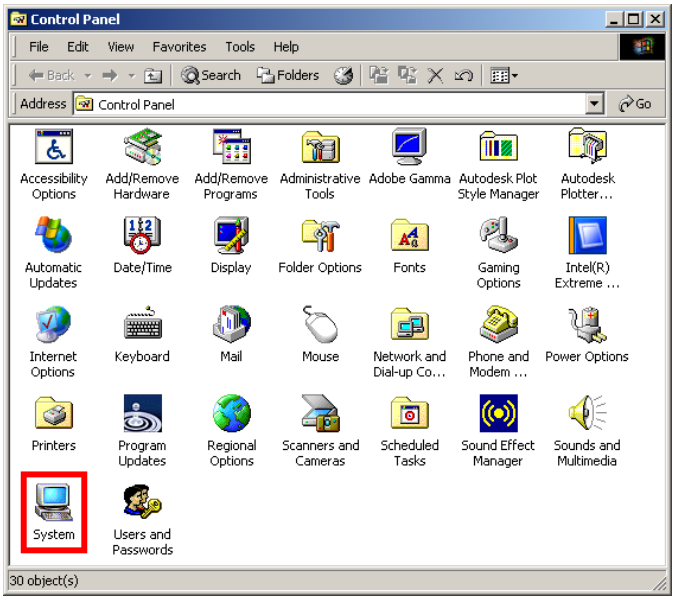

Figure 7-13: System Icon

Step 3: Click the **Device Manager** tab (**Figure 7-14**).

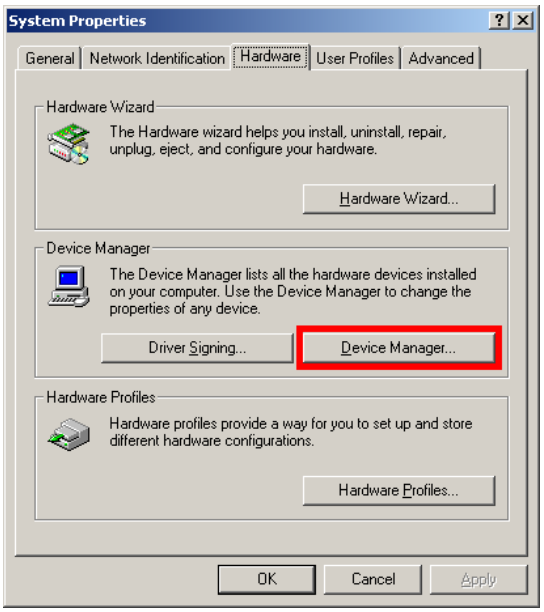
System Properties
General
Network Identification
Hardware
User Profiles
Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

Figure 7-14: Device Manager Tab

Step 4: A list of system hardware devices appears (**Figure 7-15**).

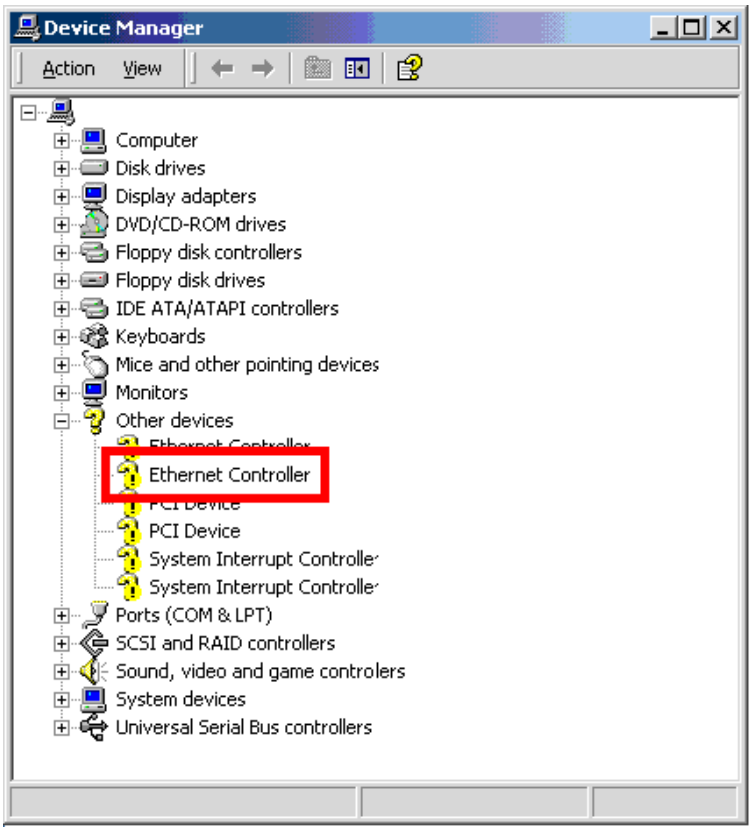

Figure 7-15: Device Manager List

Step 5: Double-click the listed device that has question marks next to it (this means Windows does not recognize the device).

Step 6: The **Device Driver Wizard** appears (**Figure 7-16**).

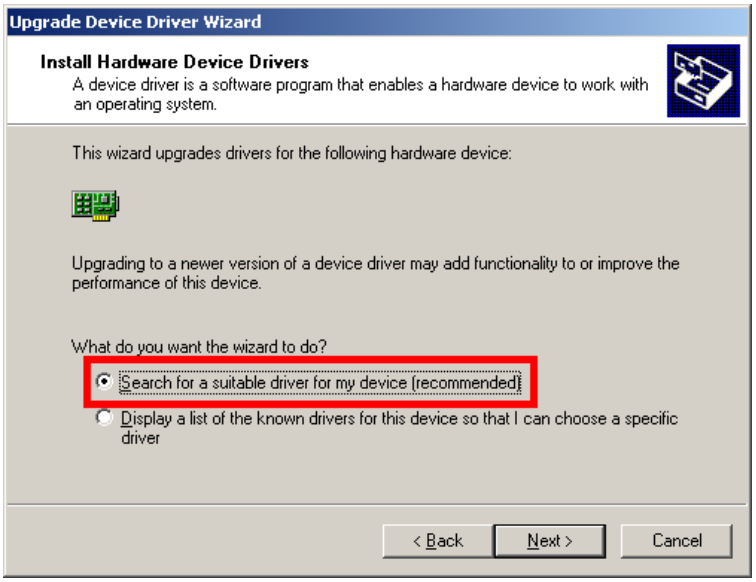
Upgrade Device Driver Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard upgrades drivers for the following hardware device:
Upgrading to a newer version of a device driver may add functionality to or improve the performance of this device.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

Figure 7-16: Search for Suitable Driver

Step 7: Select "**Search for a suitable driver for my device (recommended)**," and click **NEXT** to continue.

Step 8: Select "**Specify a Location**" in the **Locate Driver Files** window (Figure 7-18).

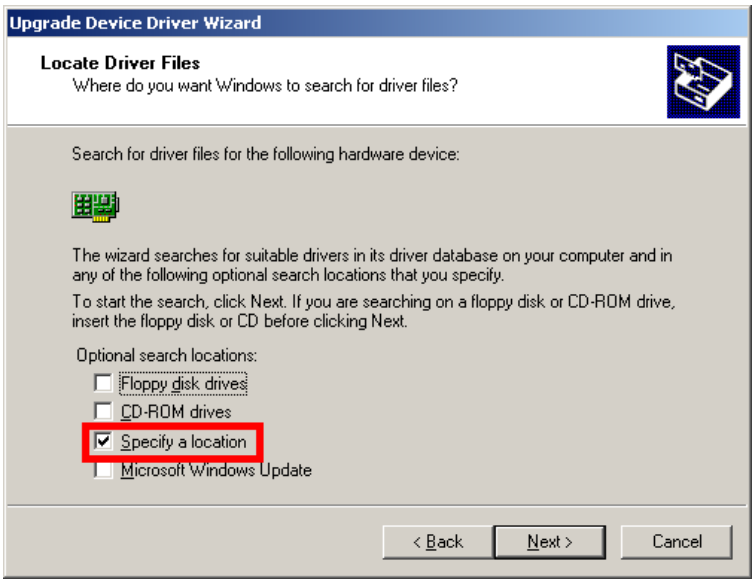
Upgrade Device Driver Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel

Figure 7-17: Locate Driver Files

Step 9: Click **NEXT** to continue.

Step 10: The **Locate File** window appears (Figure 7-18).

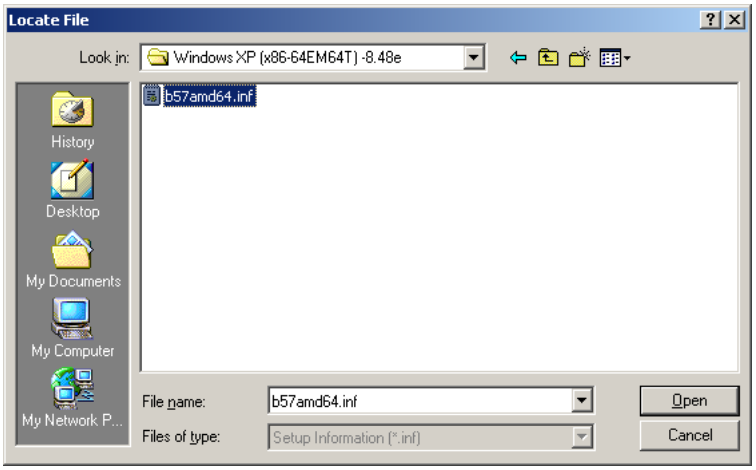

Figure 7-18: Location Browsing Window

Step 11: Select the proper OS folder under the "**X:\3-LAN\BROADCOM BCM57xx Drivers**" directory in the **Locate File** window, where "**X:\"** is the system CD drive.

Step 12: Click **OPEN** and the driver is installed.

7.5 Realtek AC`97 Audio Driver (ALC655) Installation

To install the Realtek AC `97 audio driver, please follow the steps below.

7.5.1 BIOS Setup

Step 1: Enter the BIOS setup. To do this, reboot the system and press **DEL** during POST.

Step 2: Go to the Southbridge Configuration menu. Set the **Audio Controller** option to [AC`97].

Step 3: Press **F10** to save the changes and exit the BIOS setup. The system reboots.

7.5.2 Driver Installation

To install the audio driver please follow the steps below.

Step 1: Select **AUDIO** from the list in **Figure 7-2**.

Step 2: A new window opens (Figure 7-19).

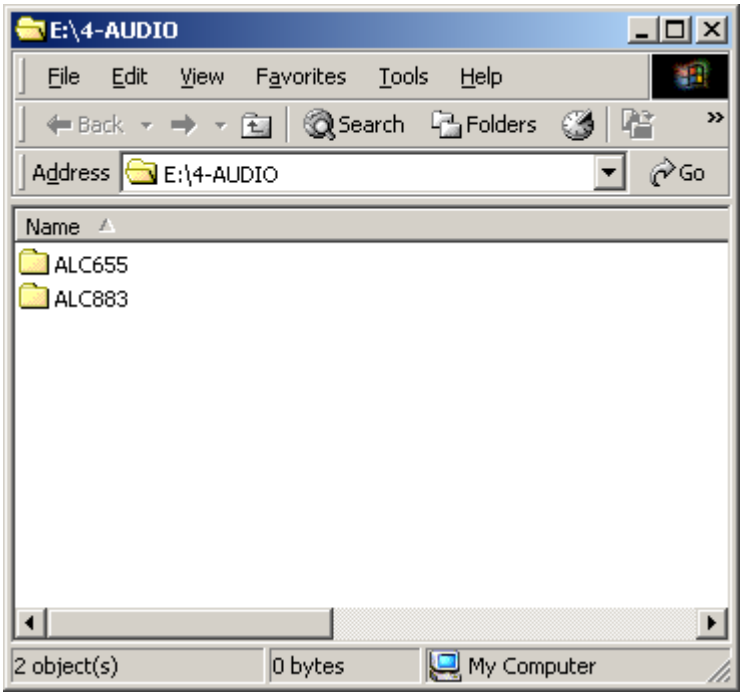

Figure 7-19: Select the Audio CODEC

Step 3: Double-click the ALC655 folder.

Step 4: Double-click the **Setup.exe** program icon in Figure 7-20.

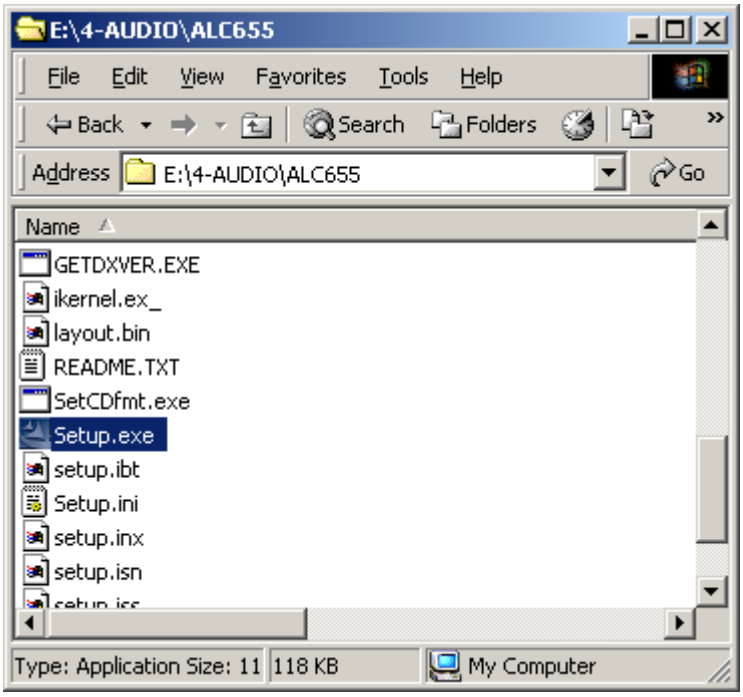

Figure 7-20: Locate the Setup Program Icon

Step 5: The **InstallShield Wizard** is prepared to guide the user through the rest of the process (Figure 7-21).

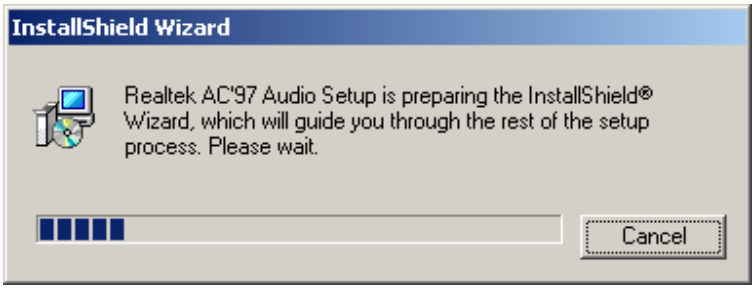
InstallShield Wizard
Realtek AC'97 Audio Setup is preparing the InstallShield® Wizard, which will guide you through the rest of the setup process. Please wait.
Cancel

Figure 7-21: Preparing Setup Screen

Step 6: Once initialized, the **InstallShield Wizard** welcome screen appears (Figure 7-22).

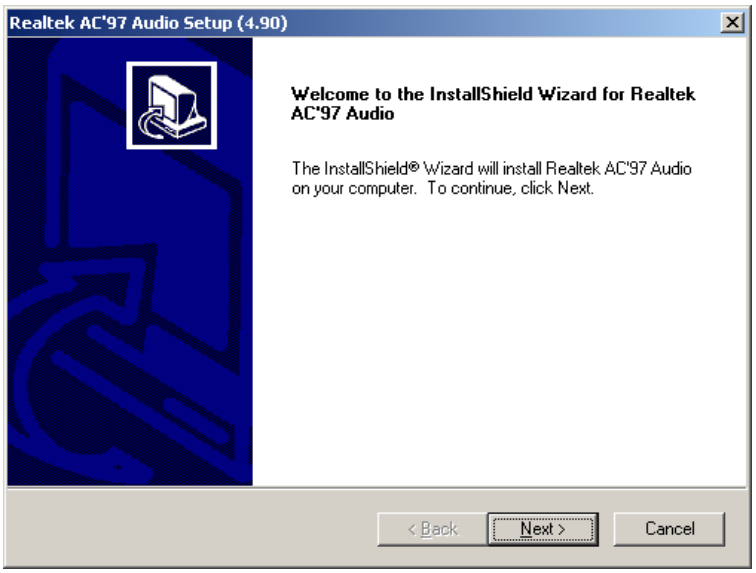
Realtek AC'97 Audio Setup (4.90)
Welcome to the InstallShield Wizard for Realtek AC'97 Audio
The InstallShield® Wizard will install Realtek AC'97 Audio on your computer. To continue, click Next.
< Back
Next >
Cancel

Figure 7-22: InstallShield Wizard Welcome Screen

Step 7: Click **NEXT** to continue the installation.

Step 8: InstallShield starts to install the new software as shown in Figure 7-23.

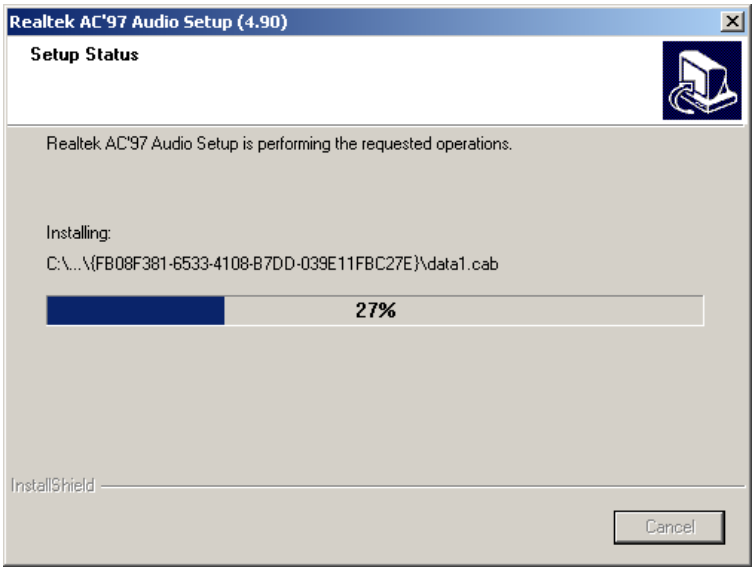

Figure 7-23: Audio Driver Software Configuration

Step 9: At this stage the **Digital Signal Not Found** screen shown in Figure 7-24 appears.

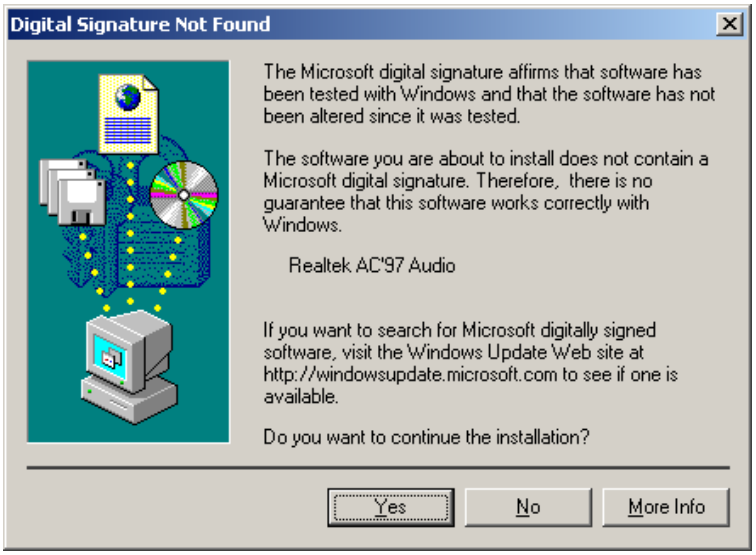
Digital Signature Not Found
The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested.
The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows.
Realtek AC'97 Audio
If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.
Do you want to continue the installation?
Yes
No
More Info

Figure 7-24: Audio Driver Digital Signal

Step 10: Click **YES** and the driver installation begins (Figure 7-25).

Figure 7-25: Audio Driver Installation

Step 11: After the driver installation process is complete, a confirmation screen appears (Figure 7-26).

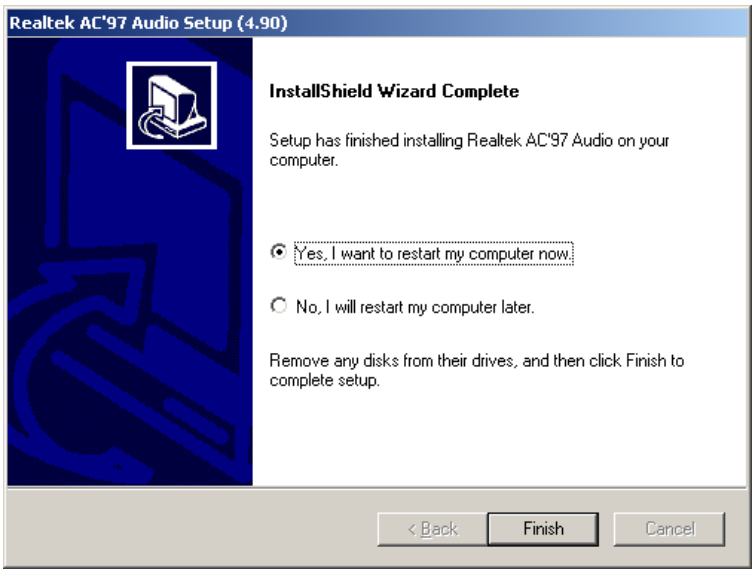
Realtek AC'97 Audio Setup (4.90)
InstallShield Wizard Complete
Setup has finished installing Realtek AC'97 Audio on your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

Figure 7-26: Restart the Computer

Step 12: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

7.6 WebPAM RAID Utility Driver Installation

To install the AMD® Matrix Storage Manager driver, please follow the steps below:

Step 1: Select **Chipset** from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-27**).

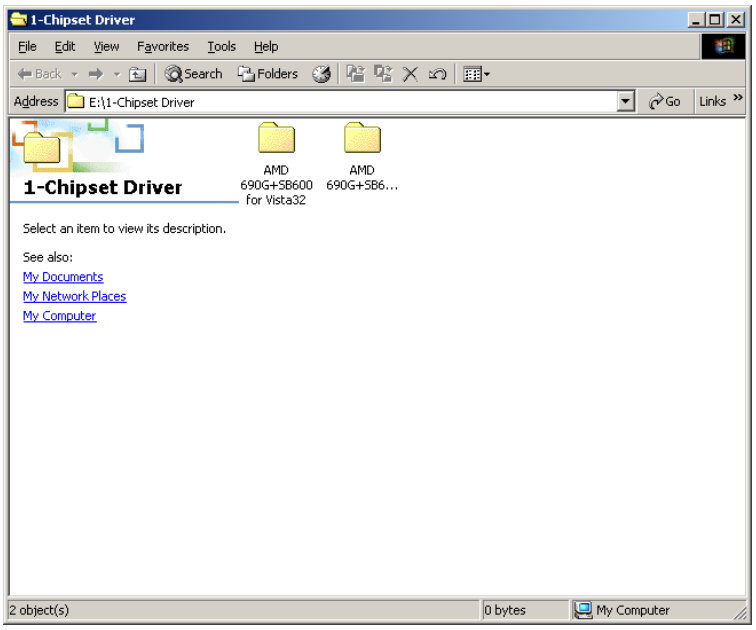

Figure 7-27: Chipset Driver Installation Program

Step 3: Double-click the directory icon for the operating system that is running on the system.

Step 4: The screen in **Figure 7-28** appears.

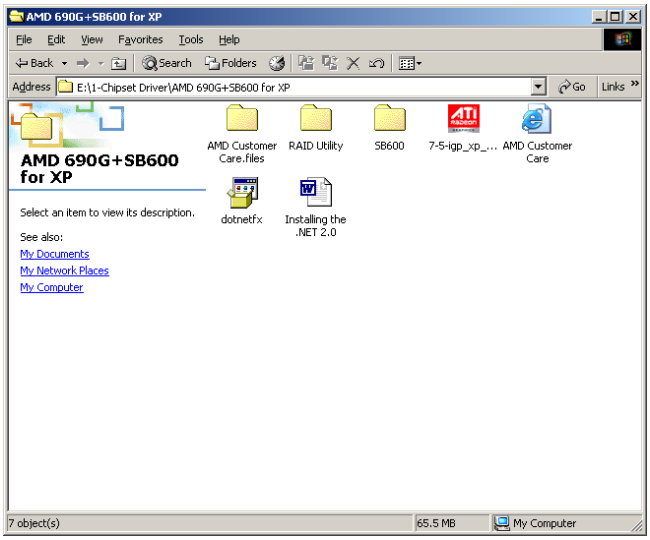

Figure 7-28: Chipset Drivers

Step 5: Open the **RAID Utility** from directory in **Figure 7-28**.

Step 6: A new window opens (**Figure 7-29**).

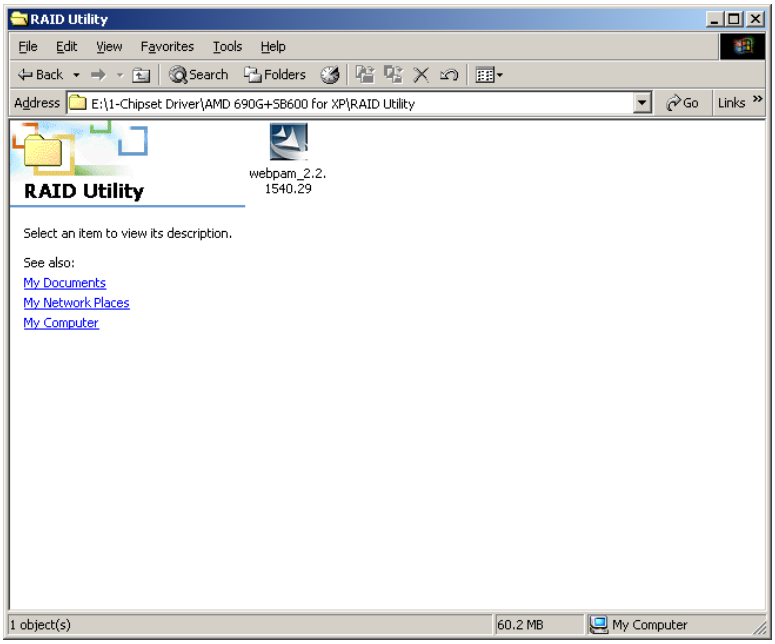

Figure 7-29: RAID Utility Icon

Step 7: Double-click the **Icon Figure 7-29**.

Step 8: The RAID Utility installation procedure is initiated as shown in **Figure 7-30**.

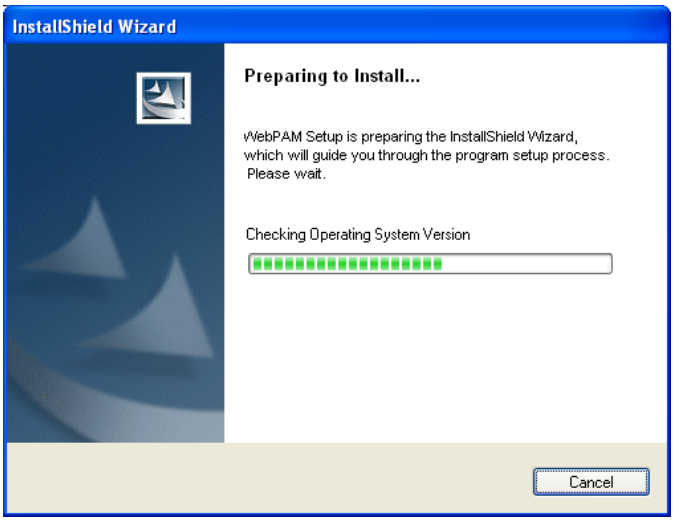
InstallShield Wizard
Preparing to Install...
WebPAM Setup is preparing the InstallShield Wizard, which will guide you through the program setup process. Please wait.
Checking Operating System Version
Cancel

Figure 7-30: SATA RAID Setup Program Icon

Step 9: The welcome screen in **Figure 7-31** appears.

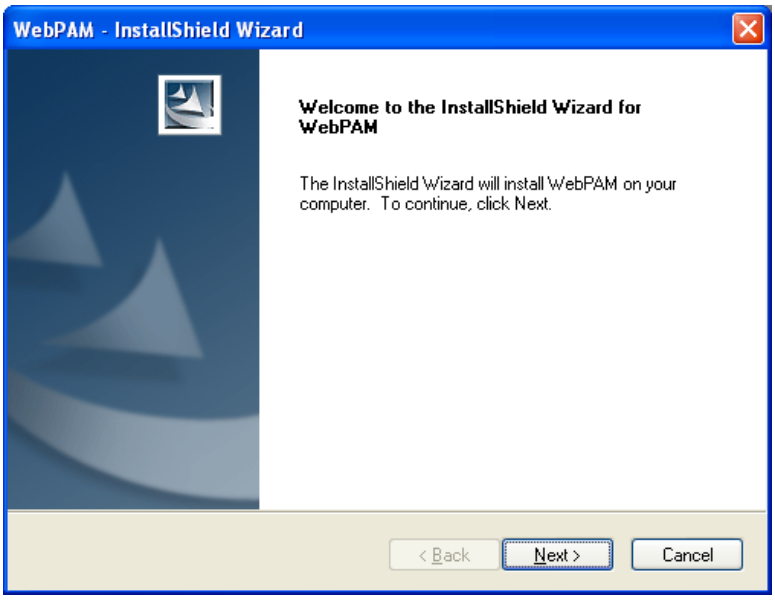
WebPAM - InstallShield Wizard
Welcome to the InstallShield Wizard for WebPAM
The InstallShield Wizard will install WebPAM on your computer. To continue, click Next.
< Back
Next >
Cancel

Figure 7-31: Welcome Screen

Step 10: Click **Next** to continue.

Step 11: The license agreement shown in **Figure 7-32** appears.

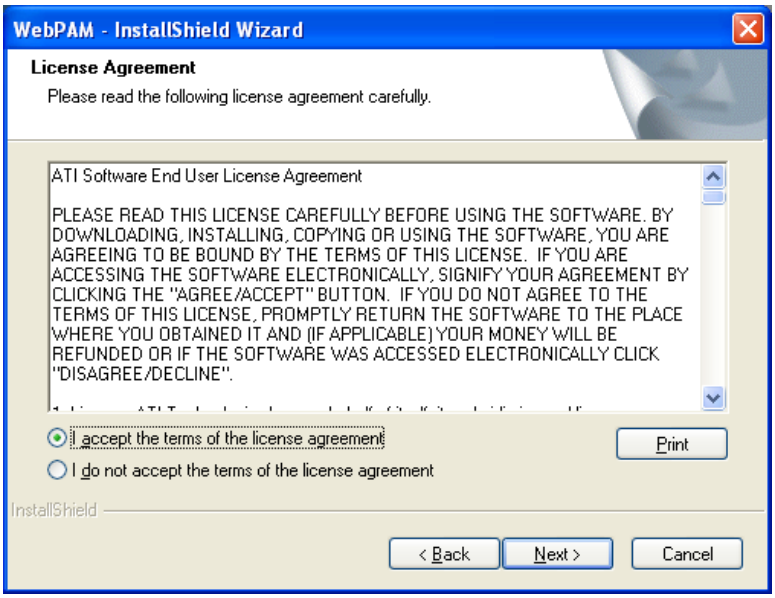
WebPAM - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
ATI Software End User License Agreement
PLEASE READ THIS LICENSE CAREFULLY BEFORE USING THE SOFTWARE. BY DOWNLOADING, INSTALLING, COPYING OR USING THE SOFTWARE, YOU ARE AGREEING TO BE BOUND BY THE TERMS OF THIS LICENSE. IF YOU ARE ACCESSING THE SOFTWARE ELECTRONICALLY, SIGNIFY YOUR AGREEMENT BY CLICKING THE "AGREE/ACCEPT" BUTTON. IF YOU DO NOT AGREE TO THE TERMS OF THIS LICENSE, PROMPTLY RETURN THE SOFTWARE TO THE PLACE WHERE YOU OBTAINED IT AND (IF APPLICABLE) YOUR MONEY WILL BE REFUNDED OR IF THE SOFTWARE WAS ACCESSED ELECTRONICALLY CLICK "DISAGREE/DECLINE".
I accept the terms of the license agreement
I do not accept the terms of the license agreement
Print
InstallShield
< Back
Next >
Cancel

Figure 7-32: WebPAM License Agreement

Step 12: Click **Next** to continue.

Step 13: The screen in **Figure 7-33** appears.

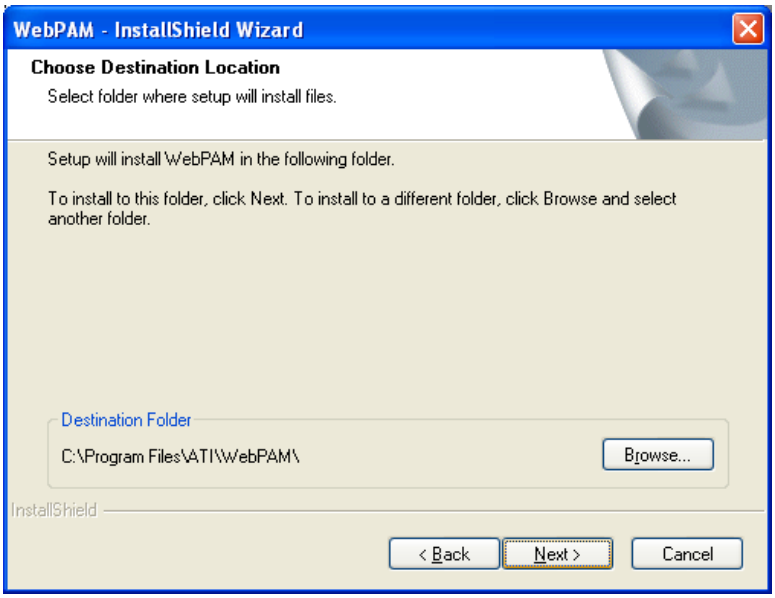
WebPAM - InstallShield Wizard
Choose Destination Location
Select folder where setup will install files.
Setup will install WebPAM in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
C:\Program Files\ATI\WebPAM\
Browse...
InstallShield
< Back
Next >
Cancel

Figure 7-33: Select WebPAM Installation Destination

Step 14: Select the destination for the WebPAM. Click **NEXT** to continue.

Step 15: The Ready to Install Program screen in **Figure 7-34** appears.

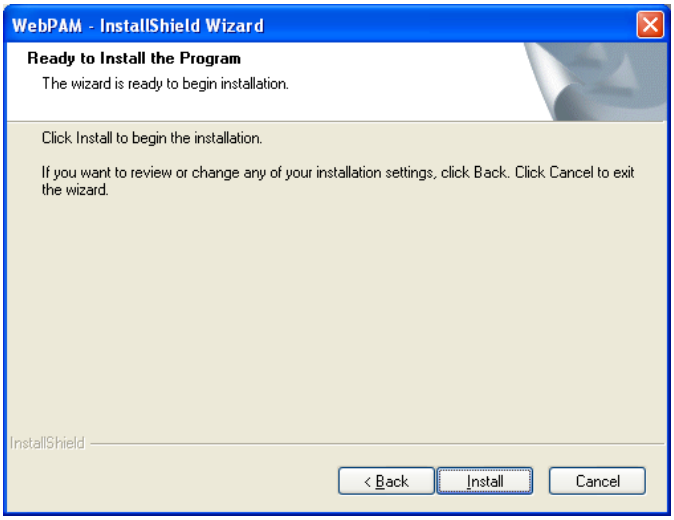
WebPAM - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

Figure 7-34: WebPAM Ready to Install

Step 16: Click **Install.**

Step 17: The WebPAM program begins to install as shown in **Figure 7-35**.

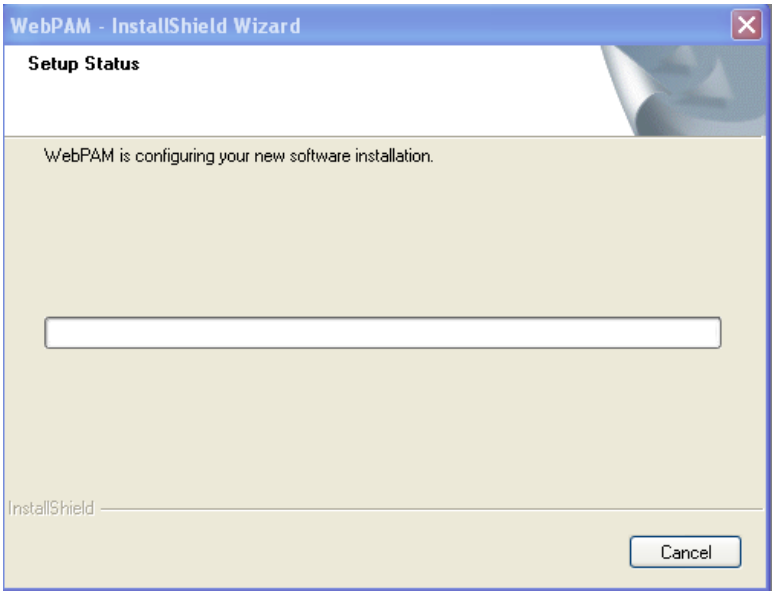

Figure 7-35: WebPAM Installation

Step 18: The Installation complete screen in **Figure 7-36** appears.

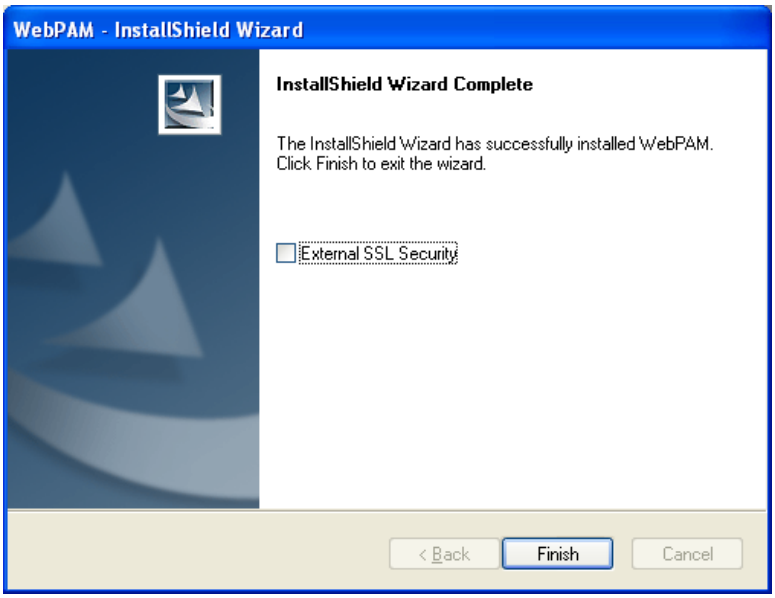

Figure 7-36: WebPAM Installation Complete

Step 19: Click **Finish** to complete WebPAM installation.

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A

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Appendix

B

DIO Interface

B.1 DIO Interface Introduction

The DIO connector on the IMBA-690AM2 is interfaced to GIO ports on the iTE Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

NOTE:

For further information, please refer to the datasheet for the iTE Super I/O chipset.

B.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

Pin	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	XIN0	27 (GP20)	General purpose I/O port 2 bit 0.
4	XOUT0	23 (GP24)	General purpose I/O port 2 bit 4.
5	XIN1	26 (GP21)	General purpose I/O port 2 bit 1.
6	XOUT1	22 (GP25)	General purpose I/O port 2 bit 5.
7	XIN2	25 (GP22)	General purpose I/O port 2 bit 3.
8	XOUT2	21 (GP26)	General purpose I/O port 2 bit 2
9	XIN3	24 (GP23)	General purpose I/O port 2 bit 6
10	XOUT3	20 (GP27)	General purpose I/O port 2 bit 7.

B.3 Assembly Language Samples

B.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

```
MOV     AX, 6F08H     Sets the digital port as input
INT     15H           Initiates the INT 15H BIOS call
```

B.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

```
MOV     AX, 6F09H     Sets the digital port as output
MOV     BL, 09H
INT     15H           Initiates the INT 15H BIOS call
```

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Appendix

C

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table C-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1     ;is the application over?
        JNE      W_LOOP         ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```

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Appendix

D

Address Mapping

D.1 Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	AMD Graphics Controller
3C0-3DF	AMD Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table D-1: IO Address Map

D.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

Table D-2: 1st MB Memory Address Map

D.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table D-3: IRQ Mapping Table

D.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table D-4: IRQ Mapping Table

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Appendix

E

Hazardous Materials Disclosure

E.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	x	O	O	O	O	x
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求。

Appendix

E

RAID Setup

F.1 Introduction

The AMD SB600 SATA RAID control can control serial ATA (SATA) disks and increase the data read/write speed and provide protection to data by distributing mirrored duplicates of data onto two disk drives (RAID 1).

CAUTION!

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

F.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID 1 array, a failed drive can be replaced and the RAID configuration restored.

WARNING!

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

CAUTION!

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

F.2 Features and Benefits

- Supports RAID levels 0, 1, and JBOD
- Supports connectivity to two disk drives
- Windows-based software for RAID management

F.3 Accessing the AMD SB600 RAID Utility

To access the **AMD RAID Utility**, please follow the steps below:

Step 1: **Connect SATA drives to the system**. Connect at least two SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

NOTE:

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration (JBOD, RAID 0 or RAID 1). If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 2: **Enable SATA drives in BIOS**. Start the computer and access the **AMI BIOS** setup program. Next, open the **Southbridge Setup** menu. Enable the **OnChip SATA Channel** option and change the **OnChip SATA Type** to **RAID**.

Step 3: **Save and Exit BIOS**. After the **SATA ROM Support BIOS** option is enabled, save and exit the **BIOS**.

Step 4: **Reboot the system**. Reboot the system after saving and exiting the **BIOS**.

Step 5: **Press Ctrl-F**. The following screen appears.

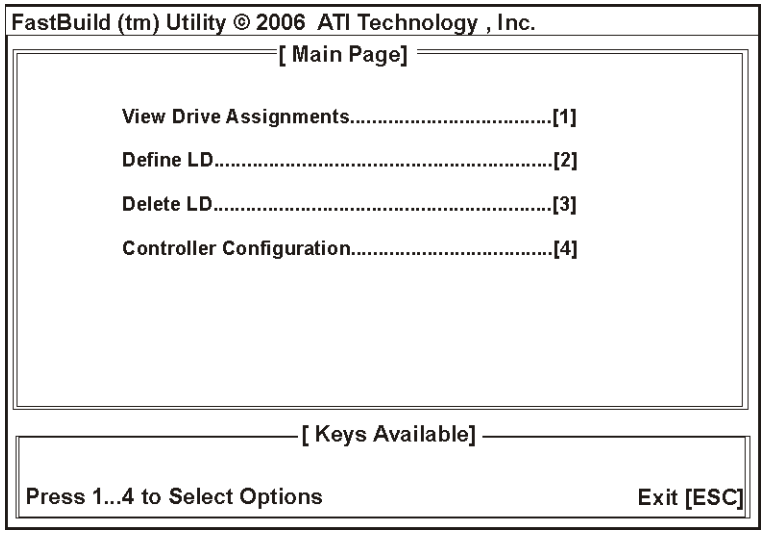

Figure F-1: Accessing AMD RAID BIOS Utility

Step 6: **Delete RAID settings and partitions**. Select **Delete LD** by pressing **3** in the **Main Page** menu above. Next, delete the drives individually.

Step 7: **Define the Logical Drive (LD)**. Select **Define LD** by pressing **2** in the **Main Page** menu above.

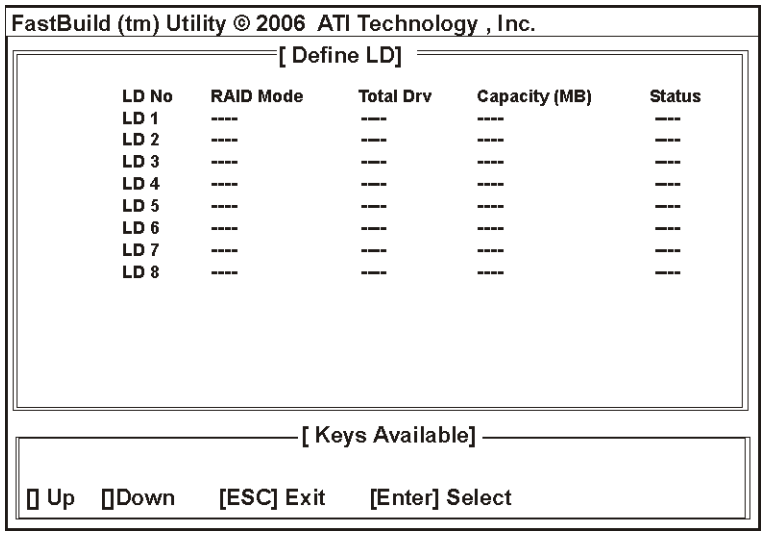
FastBuild (tm) Utility © 2006 ATI Technology , Inc.
[Define LD]
LD No RAID Mode Total Drv Capacity (MB) Status
LD 1 ---- ---- ---- ----
LD 2 ---- ---- ---- ----
LD 3 ---- ---- ---- ----
LD 4 ---- ---- ---- ----
LD 5 ---- ---- ---- ----
LD 6 ---- ---- ---- ----
LD 7 ---- ---- ---- ----
LD 8 ---- ---- ---- ----
[Keys Available]
[] Up []Down [ESC] Exit [Enter] Select

Figure F-2: Define LD

Step 8: The **RAID Configuration Options** screen shown below appears.

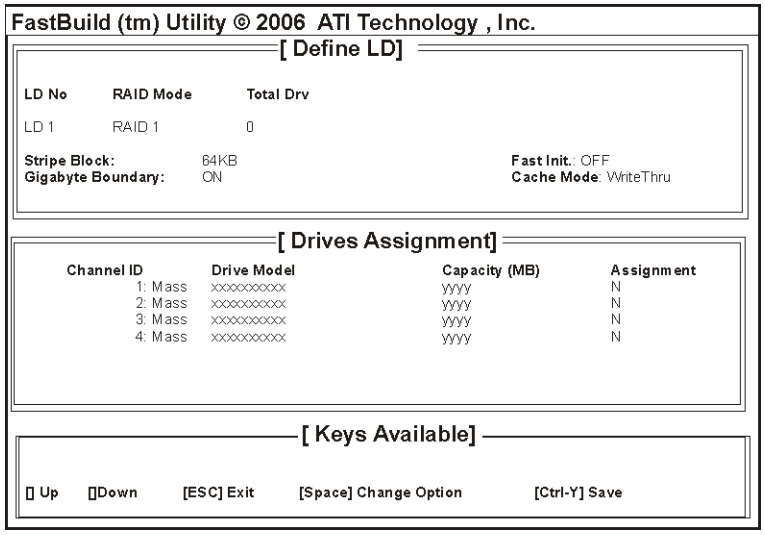

Figure F-3: RAID Configuration Options

Step 9: **Configure the RAID.** Use the configuration options in the **RAID Configuration Options** menu shown above to configure the RAID.

Step 10: **Select the RAID Mode.** The following RAID configuration options are available.

- JBOD
- RAID 0
- RAID 1
- RAID 10

Step 11: **Select the stripe block**. If necessary, select the stripe block.

Step 12: **Select the drives**. For a logical drive, at least two drives must be selected.

Step 13: **Select the Capacity**. For each drive, select the capacity of the drive that should be allocated to the logical drive.

Step 14: **Assign the drive**. For each drive, select “Y” in the assignment option.

Step 15: **Save**. Press “Ctrl-Y” to save the RAID configuration settings.

Step 16: The **LD Define** screen reappears with the newly configured LD showing.

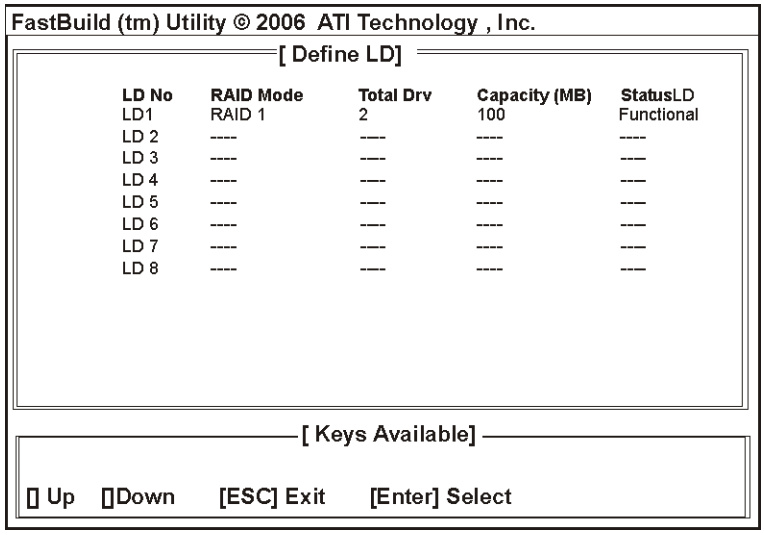
FastBuild (tm) Utility © 2006 ATI Technology , Inc.
[Define LD]
LD No RAID Mode Total Drv Capacity (MB) StatusLD
LD1 RAID 1 2 100 Functional
LD 2 ---- ---- ---- ----
LD 3 ---- ---- ---- ----
LD 4 ---- ---- ---- ----
LD 5 ---- ---- ---- ----
LD 6 ---- ---- ---- ----
LD 7 ---- ---- ---- ----
LD 8 ---- ---- ---- ----
[Keys Available]
[] Up []Down [ESC] Exit [Enter] Select

Figure F-4: RAID Configuration Options

Step 17: **Exit the Define LD screen**. To exit, press "**Escape**." The **Main Menu** reappears.

Step 18: **Exit the Main Menu and reboot**. When exiting the main menu, a prompt appears asking if the user wishes to reboot the system. Press "Y" to continue.

Step 19: **The system starts to reboot**.

Step 20: **Install the OS**. After the RAID array has been configured install the OS. To do this, please refer to the documentation that came with the OS.

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